

# Wild Mammals from the Middle Ages in Romania

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**ABSTRACT:** This paper reviews the wild mammals of medieval Romania based on data from 48 archaeozoological samples, corresponding to the early (VI-X<sup>th</sup> centuries AD), middle (XI-XIII<sup>th</sup> centuries AD) and late (XIV-XVI<sup>th</sup> centuries AD) medieval periods. The assemblages were grouped according to the geographical and historical regionalisation of the Romanian territory (i.e., Moldova, Dobrogea, Muntenia, Banat, and Transylvania). The data reveal the generally low contribution of wild mammals, despite spatial and temporal variation. The distribution of species such as red deer and brown bear decreased with time. Species currently extinct in Romania such as the aurochs, the bison and the beaver still appear in the medieval samples. The coincidence of the archaeozoological data with those from the documentary sources is remarked.

**KEY WORDS:** MIDDLE AGES, WILD MAMMALS, ROMANIA

**RESUMEN:** Este artículo evalúa el papel de los mamíferos salvajes en las sociedades medievales rumanas a partir de investigaciones arqueozoológicas realizadas en 48 yacimientos correspondientes a los periodos temprano (siglos VI-X), medio (siglos XI-XIII) y tardío (XIV-XVI) del Medioevo rumano. Las muestras se han agrupado según la regionalización geográfica e histórica del territorio rumano que incluye la Moldavia rumana, Dobruja Septentrional, Valaquia, el Banato rumano y Transilvania. Los datos revelan la baja contribución de los mamíferos salvajes al total de la fauna a pesar de la existencia de una variación espacial y temporal notable. Se aprecia cómo el área de distribución de especies tales como el ciervo y el oso disminuyó con el tiempo. El registro evidencia incluso la presencia de especies actualmente extinguidas en Rumanía como son el bisonte, el uro y el castor. Se resalta la coincidencia de estos datos con los proporcionados por las fuentes documentales.

**PALABRAS CLAVES:** EDAD MEDIA, MAMÍFEROS SALVAJES, RUMANIA

## INTRODUCTION

The relief of Romania, that includes the Carpathian Mountains, the Sub-Carpathians, hills, tablelands, plains, river meadows, and the Danube Delta, has structured the climate, soil, vegetation and fauna as well as the human settlements. The forests, which up to the Middle Ages covered large areas of Romania, were gradually cleared for farming land. Archaeozoological data evidence that, during historical times, animal husbandry was constantly practiced but hunting also kept track of historical developments.

During the first millennium, following the collapse of the Roman Empire, Goths, Huns, Gepids, Slavs, Avars, Bulgars, Magyars, Pechenegs and Cumans invaded the Romanian territory. During the first centuries of the 2<sup>nd</sup> millennium, the main historical event was the formation of the Romanian states. These principalities witnessed a short period of stability, until later invasions, wars, and internal clashes began anew (Georgescu, 1992). According to historical data, the anthropic pressure on the environment was rather low between the 6<sup>th</sup> and the 13<sup>th</sup> centuries, due to a reduced population density and the poorly developed technology (Spinei, 1996).

Our study on the role of hunting in subsistence practices, as reflected by archaeozoological studies for the Middle Ages, summarizes data from all the regions of the country, and aims at providing a database on the wild mammals for future comparative studies carried out at the macroregional and European levels of analysis.

## MATERIAL AND METHODS

This study summarises previous and recent archaeozoological analyses dealing with subsistence practices in the area (Figure 1). The analysis includes 48 faunal collections, corresponding to the three main medieval stages recognized for the Romanian Middle Ages: early (VI-X<sup>th</sup> centuries), middle (XI-XIII<sup>th</sup> centuries) and late (XIV-XVI<sup>th</sup> centuries). The assemblages were grouped according to geographical criteria into the five zones recognized for Romania, namely, Moldavia, Dobrogea, Muntenia, Banat and Transylvania. Most of the bone assemblages derive from rural settlements, and only three are urban, seven military and the last two represent elite contexts (Table

1). Birds were not included in the study due to their generally low NISPs (i.e., Number of identified specimens). All of the analysed samples were recovered by hand, thus are not of much value when it comes to assess the relevance of medium and small size taxa.

The faunal analyses were done at the Laboratory of Animal Morphology, Faculty of Biology, of the «Alexandru Ioan Cuza» University of Iasi. The methodology included anatomical, taxonomical and taphonomical identifications, as well as osteometry, encoding and quantification of the data (Udrescu *et al.*, 1999). In the case of red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), and wild boar (*Sus scrofa ferus*), age estimation was possible by applying data on tooth eruption and wear of the permanent mandibular teeth, provided by game management analysis (Cotta & Bodea, 1969). Only the essentials from these analyses will be presented in this paper.

In order to make the samples comparable, the proportion of each species was calculated as a ratio between the species' NISP and the total number of remains of the site. The relationship between species and site type (e.g., whether rural, urban, elite or military) was explored by means of a correspondence analysis (CA). The similarity of sites was analysed through an agglomerative hierarchical clustering (AHC), considering species as the variables. The similarity was expressed in terms of a Spearman correlation index, and the agglomeration method employed was the unweighted pair-group average. CA and AHC were carried out with the XLSTAT Version 2009.1.02 software.

There are some limitations to this study that concern a series of variables. Foremost among these is the fact that some of the samples (e.g., Chilieni, Slon, Hudum, Nicolina, Hlincea) do not display comparably significant frequencies, due to their small size (Table 2). Also, none of the assemblages were sieved, and this not only caused an overrepresentation of the large animals, the ungulates in particular, but also an underrepresentation of unknown but surely negative consequences. No wonder that the remains from the small species are always scarce. In addition, the smaller of the carnivores such as *Martes* sp., *Meles meles*, *Mustela* sp. and *Vulpes vulpes*, hunted for their furs, were probably skinned outside of the human settlements. Consequently, their low frequencies may have cultural reasons as well as methodological ones but



FIGURE 1

Map of Romania showing the location of the medieval sites (1. Stefan cel Mare; 2. Udesti; 3. Poiana; 4. Lozna-Strateni; 5. Malesti; 6. Vararie; 7. Chilanesti; 8. Gara Banca; 9. Barlad; 10. Barlalesti; 11. Nicolina; 12. Hlincea; 13. Vaslui; 14. Negresti; 15. Bornis (including Malesti); 16. Baia; 17. Siret; 18. Hudum; 19. Dumbraveni; 20. Oltina; 21. Dinogetia/Garvan; 22. Noviodunum/Isaccea; 23. Capidava; 24. Carsium/Harsova; 25. Prislava/Nufaru; 26. Beroe/Piatra Frecatei; 27. Ciurel; 28. Radovanu; 29. Bucov; 30. Slon; 31. Pauleasca; 32. Dridu; 33. Bucu; 34. Piua-Petrii; 35. Gornea-1; 36. Gornea-2; 37. Ilidia; 38. Gornea-3; 39. Parta; 40. Moldova-Veche; 41. Berzovia; 42. Sannicolau-Roman; 43. Biharia; 44. Sannicolau-Beius; 45. Oradea-1; 46. Chilieni; 47. Oradea-2; 48. Simleul Silvaniei).

one is unable to calibrate them. Finally, the presence of burrowing taxa such as the ground squirrel *Citellus citellus* must always be considered with caution as these may represent intrusive elements.

## RESULTS AND DISCUSSION

As can be seen in Tables 2-4, Romanian mammal assemblages from the Middle Ages feature a low proportion of wild animals, although a spatial and temporal patterning seems evident.

### *Assemblage variability*

In Moldavia the percentages of wild mammals range between 14.3% at Chilanesti (VIII-X<sup>th</sup> centuries) (Archaeofauna 19 (2010): 121-131

and 0.6% in the urban sites of XIV-XVI<sup>th</sup> century (i.e., Vaslui, Baia and Siret). The average of the frequencies is high for the XI-XIII<sup>th</sup> centuries (5.9%) and low for the XIV-XVI<sup>th</sup> centuries (2.3%). In Dobrogea, the percentages of wild mammals are slightly higher, averaging 3.7% in the assemblages of the VI-X<sup>th</sup> centuries (Dumbraveni and Oltina) and 9.8% for the Byzantine settlements of the X-XIII<sup>th</sup> centuries (i.e., Dinogetia/Garvan, Noviodunum/Isaccea, Capidava, Carsium/Harsova, Prislava/Nufaru, and Beroe/Piatra Frecatei). Muntenia features the lowest frequencies of wild mammals, with averages ranging between 3.5% (VI-X<sup>th</sup> centuries) and 0.2% (XIV-XVI<sup>th</sup> centuries). Wild mammals are better represented in Banat (21%) and Transylvania (8.3%). In Banat the averages are high during the first periods (22.5%) and low in the XIV-XVI<sup>th</sup>

Region	Site (centuries)	Context	Reference
<b>Moldavia</b>	1 Stefan cel Mare (VI-X <sup>th</sup> )	rural	Haimovici, 1987a
	2 Udesti (VI-X <sup>th</sup> )	rural	Haimovici & Carpus, 1982
	3 Poiana (VI-X <sup>th</sup> )	rural	Stanc, 2003
	4 Lozna-Strateni (VI-X <sup>th</sup> )	rural	Haimovici, 1986a
	5 Malesti (VI-X <sup>th</sup> )	rural	Haimovici, 1987b
	6 Vararie (VI-X <sup>th</sup> )	rural	Haimovici, 1987b
	7 Chilanesti (VI-X <sup>th</sup> )	rural	Ungurianu, 2000
	8 Gara Banca (VI-X <sup>th</sup> )	rural	Haimovici, 1986b
	9 Barlad (XI-XIII <sup>th</sup> )	rural	Haimovici, 1980
	10 Barlalesti (XI-XIII <sup>th</sup> )	rural	Haimovici, 1984
	11 Nicolina (XI-XIII <sup>th</sup> )	rural	Haimovici, 1993a
	12 Hlincea (XIV-XVI <sup>th</sup> )	rural	Haimovici & Cojocaru, 1987
	13 Vaslui (XIV-XVI <sup>th</sup> )	urban	Haimovici, 1992
	14 Negresti (XIV-XVI <sup>th</sup> )	rural	Haimovici & Cojocaru, 1987
	15 Bornis (XIV-XVI <sup>th</sup> )	rural	Haimovici, 1994
	16 Baia (XIV-XVI <sup>th</sup> )	urban	Bejenaru, 2003
	17 Siret (XIV-XVI <sup>th</sup> )	urban	Bejenaru, 2009
	18 Hudum (XIV-XVI <sup>th</sup> )	rural	Haimovici 1993b
<b>Dobrogea</b>	19 Dumbraveni (VI-X <sup>th</sup> )	rural	Haimovici, 2000
	20 Oltina (VI-X <sup>th</sup> )	military	Stanc, 2003
	21 Dinogetia/Garvan (XI-XIII <sup>th</sup> )	military	Haimovici, 1989
	22 Noviodunum/Isaccea (XI-XIII <sup>th</sup> )	military	Bejenaru, 2003
	23 Capidava (XI-XIII <sup>th</sup> )	military	Haimovici & Ureche, 1979
	24 Carsium/Harsova (XI-XIII <sup>th</sup> )	military	Bejenaru, 1995
	25 Prislava/Nufaru (XI-XIII <sup>th</sup> )	military	Bejenaru, 2007
	26 Beroe/Piatra Frecatei (XI-XIII <sup>th</sup> )	military	Stanc, 2009
<b>Muntenia</b>	27 Ciurel (VI-X <sup>th</sup> )	rural	Udrescu, 1979
	28 Radovanu (VI-X <sup>th</sup> )	rural	Haimovici, 1995; <i>Idem</i> , 2003
	29 Bucov (VI-X <sup>th</sup> )	rural	Haimovici, 1979
	30 Slon (VI-X <sup>th</sup> )	rural	Haimovici, 1991
	31 Pauleasca (VI-X <sup>th</sup> )	rural	Haimovici & Gava, 2002
	32 Dridu (XI-XIII <sup>th</sup> )	rural	Necrasov & Haimovici, 1967
	33 Bucu (XI-XIII <sup>th</sup> )	rural	Moise, 2000
	34 Piu�-Petrii (XIV-XVI <sup>th</sup> )	rural	Bejenaru, 2003
<b>Banat</b>	35 Gornea-1 (VI-X <sup>th</sup> )	rural	El Susi, 1996
	36 Gornea-2 (VI-X <sup>th</sup> )	rural	El Susi, 1996
	37 Ilidia (XI-XIII <sup>th</sup> )	rural	El Susi, 1996
	38 Gornea-3 (XI-XIII <sup>th</sup> )	rural	El Susi, 1996
	39 Parta (XI-XII <sup>th</sup> )	rural	El Susi, 1996
	40 Moldova-Veche (XI-XII <sup>th</sup> )	rural	El Susi, 1996
	41 Berzovia (XIV-XVI <sup>th</sup> )	elite	El Susi, 1996
<b>Transylvania</b>	42 Sannicolau-Roman (VI-X <sup>th</sup> )	rural	Haimovici, 1989
	43 Biharia (VI-X <sup>th</sup> )	rural	Haimovici, 1988
	44 Sannicolau-Beius (XI-XIII <sup>th</sup> )	rural	Udrescu, 1987; <i>Idem</i> , 1990
	45 Oradea-1 (XI-XII <sup>th</sup> )	elite	Bejenaru, 2003
	46 Chilieni (XI-XIII <sup>th</sup> )	rural	Haimovici, 1992
	47 Oradea-2 (XIV-XVI <sup>th</sup> )	military	Bejenaru, 2003
	48 Simleul Silvaniei (XIV-XVI <sup>th</sup> )	rural	El Susi, 2000

TABLE 1

Medieval settlements from Romania.

centuries (i.e., around 12%). In Transylvania, the lowest average is 5.6% for the VI-X<sup>th</sup> centuries and the maximum, 11.5%, corresponds to the XI-XIII<sup>th</sup> centuries.

In this way, the five major regions of the country exhibit not only differences and coincidences but also variability at the local level in the importance of hunted mammals, the maximum



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Centuries	VI-X <sup>th</sup>								XI-XIII <sup>th</sup>			XIV-XVI <sup>th</sup>							
Site	1 R	2 R	3 R	4 R	5 R	6 R	7 R	8 R	9 R	10 R	11 R	12 R	13 U	14 R	15 R	16 U	17 U	18 R	
Total identified	95	745	934	735	166	86	217	886	658	935	43	152	1558	323	1837	3471	5183	63	
Wild mammals	3	15	69	62	1	4	31	19	72	21	2	4	6	24	18	42	17	2	
<i>Lepus europaeus</i>	-	-	-	2	-	-	-	-	-	1	-	-	2	9	-	2	3	-	
<i>Castor fiber</i>	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Martes</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
<i>Ursus arctos</i>	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	3	1	-	
<i>Canis lupus</i>	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	
<i>Vulpes vulpes</i>	-	-	4	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	
<i>Sus scrofa</i>	3	12	20	9	-	-	5	-	4	3	2	2	1	4	2	10	8	-	
<i>Capreolus capreolus</i>	-	-	6	5	-	1	4	-	8	5	-	2	1	3	4	12	-	-	
<i>Cervus elaphus</i>	-	3	37	43	-	3	22	14	59	12	-	-	1	8	12	13	3	2	
<i>Bos primigenius</i>	-	-	-	2	-	-	-	3	1	-	-	-	-	-	-	2	1	-	

TABLE 2

Number of identified remains (NISP) of wild mammals from Moldovan sites (R – rural; U – urban): 1. Stefan cel Mare; 2. Udesti; 3. Poiana; 4. Lozna-Strateni; 5. Malesti; 6. Vararie; 7. Chilanesti; 8. Gara Banca; 9. Barlad; 10. Barlalesti; 11. Nicolina; 12. Hlincea; 13. Vaslui; 14. Negresti; 15. Bornis; 16. Baia; 17. Siret; 18. Hudum.

Region	Dobrogea								Muntenia								
Centuries	VI-X <sup>th</sup>		XI-XIII <sup>th</sup>						VI-X <sup>th</sup>					XI-XIII <sup>th</sup>		XIV-XVI <sup>th</sup>	
Sites	19 R	20 M	21 M	22 M	23 M	24 M	25 M	26 M	27 R	28 R	29 R	30 R	31 R	32 R	33 R	34 R	
Total identified	424	1669	2961	1837	1460	1396	543	3920	31	489	3617	79	70	1962	471	389	
Wild mammals	16	60	261	97	66	57	79	843	2	12	72	1	4	26	12	1	
<i>Lepus europaeus</i>	1	3	3	-	1	-	-	3	-	-	3	-	-	9	2	-	
<i>Castor fiber</i>	-	2	-	-	1	1	-	5	-	-	-	-	-	-	-	-	
<i>Citellus citellus</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Martes</i> sp.	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	
<i>Meles meles</i>	-	-	5	-	1	-	-	-	-	-	-	-	-	-	-	-	
<i>Mustela nivalis</i> ?	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Canis lupus</i>	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	
<i>Vulpes vulpes</i>	-	1	2	-	-	2	-	3	-	-	-	-	-	-	-	-	
<i>Lutra lutra</i>	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Felis sylvestris</i>	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Sus scrofa</i>	3	17	56	33	28	26	60	331		4	17			6	4		
<i>Alces alces</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Capreolus capreolus</i>	4	4	6	1	8	7	1	11	-	-	2	-	1	-	-	1	
<i>Cervus elaphus</i>	6	33	184	58	27	20	17	488	2	7	38	1	3	11	6		
<i>Bos primigenius</i>	-	-	1	4	-	-	-	1	-	1	12	-	-	-		-	

TABLE 3

Number of identified remains (NISP) of wild mammals at sites from Dobrogea and Muntenia (R – rural; M – military): 19. Dumbraveni; 20. Oltina; 21. Dinogetia/Garvan; 22. Noviodunum/Isaccea; 23. Capidava; 24. Carsium/Harsova; 25. Prislava/Nufaru; 26. Beroe/Piatra Frecatei; 27. Ciurel; 28. Radovanu; 29. Bucov; 30. Slon; 31. Pauleasca; 32. Dridu; 33. Bucu; 34. Piua-Petrii.

values being recorded for Banat. These differences could reflect adaptations of the local populations. The amount of wild mammal remains identified in the Byzantine settlements of the X-XIII<sup>th</sup> centuries, for example, indicates that game was an important environmental resource. Nevertheless, since these settlements were military forts located near large forests, in areas of fertile soil and plenty

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Region	Banat							Transylvania						
Centuries	VI-X <sup>th</sup>		XI-XIII <sup>th</sup>					VI-X <sup>th</sup>		XI-XIII <sup>th</sup>			XIV-XVI <sup>th</sup>	
Sites	35 R	36 R	37 R	38 R	39 R	40 R	41 E	42 R	43 R	44 R	45 E	46 R	47 M	48 R
Total identified	614	225	569	121	430	375	480	43	89	300	798	15	528	2164
Wild mammals	126	60	67	22	167	73	58	1	8	56	21	2	2	164
<i>Lepus europaeus</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	1
<i>Castor fiber</i>	-	-	-	-	-	2	-	-	-	-	-	-	-	-
<i>Martes sp.</i>	-	-	-	-	-	1	2	-	-	-	-	-	-	-
<i>Meles meles</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-
<i>Vulpes vulpes</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2
<i>Ursus arctos</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	3
<i>Sus scrofa</i>	44	18	15	7	26	22	32	-	1	1	12	-	2	54
<i>Capreolus capreolus</i>	14	7	7	2	15	4	9	1	1	1	-	-	-	8
<i>Cervus elaphus</i>	61	35	42	11	121	38	13	-	6	53	9	2	-	91
<i>Bos primigenius</i>	7	-	3	2	5	5	-	-	-	1	-	-	-	5

TABLE 4

Number of identified remains (NISP) of wild mammals at sites from Banat and Transylvania (R – rural; E – elite; M – military): 35. Gornea-1; 36. Gornea-2; 37. Ilidia; 38. Gornea-3; 39. Parta; 40. Moldova-Veche; 41. Berzovia; 42. Sannicolau-Roman; 43. Biharia; 44. Sannicolau-Beius; 45. Oradea-1; 46. Chilieni; 47. Oradea-2; 48. Simleul Silvaniei.

of game, one can postulate that there could have existed both social and environmental reasons to explain the high frequencies of wild mammals.

An overview of the data from a diachronic perspective evidences that in the period corresponding to the VI-X<sup>th</sup> and XI-XIII<sup>th</sup> centuries hunting is better represented in all regions. In Muntenia the average of the wild mammal contributions decreased with time. No doubt that historical events shaped some of these trends. The relative stability brought about after the foundation of the Romanian principalities encouraged animal husbandry. Along with it, documentary sources from the XIV-XVI<sup>th</sup> centuries evidence that restrictions for hunting were applied to the ordinary people (Giurescu, 1976). Poor people were allowed to hunt only in order to pay their taxes as meat and furs. Both private and state-regulated domains were protected against logging, grazing, fishing and hunting. No doubt that all these constraints could explain the low representation of wild mammals in sites of this period.

In consonance with the high frequencies of game in the XI-XIII<sup>th</sup> centuries sites, taxonomic variability is also higher (Tables 2-4). The region with the highest number of wild mammals then is

Dobrogea, probably due to the rich and diversified biotopes found in the lower valley of the Danube river. Still, one should not forget that seven of the settlements from Dobrogea (i.e., Oltina, Dinogetia/Garvan, Noviodunum/Isaccea, Capidava, Carsium/Harsova, Prislava/Nufaru, Beroe/Piatra Frecatei) are Byzantine military forts where hunting must have also been a regular practice.

#### *Species variety*

To a large extent, the diversity of wild mammals depends on the size of the identified assemblage (Tables 2-4). The most frequent species, such as red deer, wild boar, and roe deer, are present in the majority of the assemblages, whereas rare species, such as the carnivores, are mostly recorded on the larger samples. The quantification in terms of NISPs evidences differences in the contributions of the various species.

The average proportion of red deer remains is higher in all of the rural sites, irrespective of the province, whereas wild boar exhibits higher values in the elite site of Banat (Berzovia, a feudal domain) and also in the Byzantine military forts (Table 5).

SPECIES	Moldova		Dobrogea		Banat		Transylvania
	rural	urban	rural	military	rural	elite	rural
<i>Cervus elaphus</i>	<b>3.81</b>	0.17	<b>1.42</b>	<b>4.31</b>	<b>13.37</b>	2.7	<b>10.49</b>
<i>Sus scrofa</i>	1.69	0.168	0.71	<b>4</b>	5.92	<b>6.7</b>	1.32
<i>Capreolus capreolus</i>	0.94	0.2	0.94	0.29	2.14	1.9	1.04

TABLE 5

Average %NISP of the main wild ungulates from four regions according to site context.

Although the relation between red deer, wild boar and site type parallels the results from other parts of Europe (eg., France; Yvinec, 1993; Chaix & Meniel, 1996), the Correspondence analysis indicates that these tendencies in Romania are of low statistical significance (e.g.,  $\chi^2 = 41.18$ ,  $df = 48$ ,  $p = 0.75$  for the relation between red deer and

site type, and  $\chi^2 = 41.47$ ,  $df = 30$ ,  $p = 0.08$  for the relation between wild boar and site type).

Species similarities based on their proportions at the various sites are shown in Figure 2. The variables (species frequencies in relation to sites) associate into four groups. The first group incorporates the most common species, that one assu-

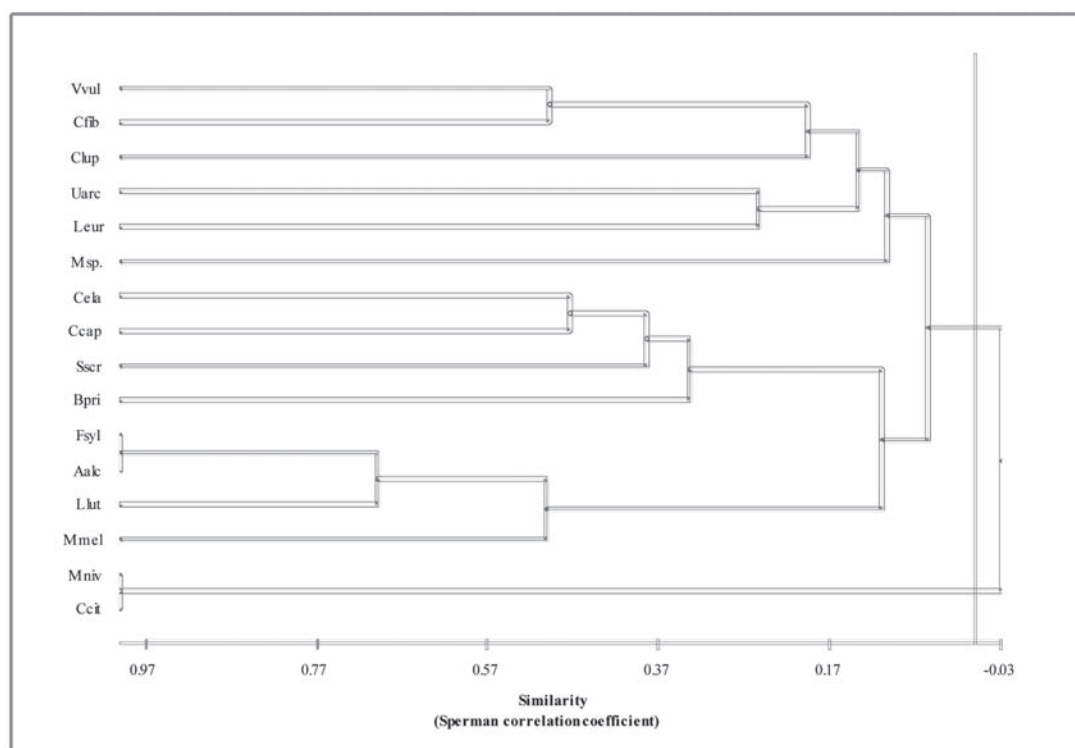


FIGURE 2

Species similarities (AHC) based on their NISP's proportions in sites (Aak - *Alces alces*; Bpri - *Bos primigenius*; Clup - *Canis lupus*; Ccap - *Capreolus capreolus*; Cfib - *Castor fiber*; Cela - *Cervus elaphus*; Ccit - *Citellus citellus*; Fsyl - *Felis sylvestris*; Leur - *Lepus europaeus*; Llut - *Lutra lutra*; Msp. - *Martes sp.*; Mmel - *Meles meles*; Mniv - *Mustela nivalis*; Sscr - *Sus scrofa*; Uarc - *Ursus arctos*; Vvul - *Vulpes vulpes*).

mes were hunted regularly for food procurement throughout the country (i.e., *Cervus elaphus*, *Capreolus capreolus*, *Sus scrofa*, and *Bos primigenius*). The second group consists of taxa featuring low frequencies but wide distributions throughout the Romanian territory (i.e., *Vulpes vulpes*, *Ursus arctos*, *Martes* sp., *Lepus europaeus*, and *Castor fiber*). The third group includes species with low frequencies associated with the military settlements of Dobrogea (*Alces alces*, *Felis sylvestris*, *Lutra lutra*, and *Meles meles*). The fourth group includes two species, *Citellus citellus* and *Mustela nivalis*, that not only are extremely rare, but that most probably constitute intrusive elements of the faunal collections.

Concerning the specifics of the distributions, archaeozoological records of forest species coincide with areas where large forests are mentioned by the documentary sources (Giurescu, 1976). Two species nowadays considered as Carpathian elements, i.e. the red deer and the bear (Cotta, 1982), were in the Middle Ages widespread well beyond these mountains. The large number of non-Carpathian sites that have provided remains of red deer (Tables 2-4) confirm the historiographical information testifying to the wide distribution of this species during the Romanian Middle Ages (Giurescu, 1976). Of particular relevance are the records of red deer from sites located well beyond its present day area of distribution. These include sites in the plains of Moldova (i.e., Hudum, Vaslui, Barlad, Barlalesti), Muntenia (i.e., Dridu, Ciurel, Radovanu, Pauleasca, Bucu), Banat (i.e., Gornea, Parta), Transylvania (Oradea), and in the lower valley of the Danube river (i.e., Oltina, Capidava, Carsium/Harsova, Beroe/Piatra Freceatei, Dinogetia/Garvan, Noviodunum/Isaccea, Prislava/Nufaru). Bear remains have been likewise identified in six non-Carpathian settlements from Moldavia (i.e., Poiana, Malesti, Baia, Siret), Banat (Berzovia), and Transylvania (Simleul Silvaniei).

A cranium trophy of a bison (*Bison bonasus*), a species no longer member of the Romanian fauna, was identified in the Musatini Fort in Moldavia (XIV-XV<sup>th</sup> centuries) (Haimovici & Tarabuta, 1968). Documentary sources indicate that the last bison ever spotted in Romania was the one shot down in the XIX<sup>th</sup> century at Maramures (northern Transylvania; Nania, 1991).

In the case of the elk (*Alces alces*), there is but a single archaeozoological find from the lower valley of the Danube river. The animal recorded at

Dinogetia/Garvan probably arrived during the course of its winter migration from the north-east. The singularity of this find contradicts XIII<sup>th</sup> century documentary information from Albert Magnus, who testifies to the regular presence of this species, that he names *Equicerus*, in the mountain and forest regions of both Transylvania and Maramures. Additional documents specify that the rulers from Transylvania used to send live animals as gifts to the West, and among these there were also elks (Nania, 1991). In his *Descriptio Moldaviae*, Dimitrie Cantemir, who was probably referring to the elk when he mentioned the *bubalus* (a name used in the Middle Ages to designate large-sized artiodactyls), considered these animals as non-autochthonous to the area, believing that they were reaching the Moldavian territory during their winter migration from the north-east (Haimovici, 1974).

Aurochs (*Bos primigenius*) was the symbol of medieval Moldavia, often represented on seals and coats of arms (Nania, 1991). The aurochs has been documented for the earliest periods in all of the main regions, but only in Moldavia (i.e., Siret, Baia), and Transylvania (Simleul Silvaniei) after the XIV-XVI<sup>th</sup> centuries. Remarkable also is that remains of the aurochs are more frequent in Banat. The medieval documents show that the last aurochs vanished from the Moldavian fauna probably by the beginning of the XVII<sup>th</sup> century (Nedici, 1940). It is known that aurochs at the time would visit the lower valleys, closer to human settlements, in their quest for food, causing damage to the crops near the woods during summertime (Filipascu, 1969).

Beaver (*Castor fiber*) is also a species with a low representation in the archaeozoological collections, identified at five settlements from the Danube Valley, no later than the XIII<sup>th</sup> century, and also in two Moldavian sites from the VI-X<sup>th</sup> centuries (Tables 2-4). Beavers also became extinct in Romania during the XIX<sup>th</sup> century. Moldova Veche, on the bank of the Danube river, was the last place from where Romanian beavers were reported. In 1823 and in 1853 other documentary sources note that beavers no longer inhabit the Danube Delta (Nania, 1991).

#### *Game selection according to age and sex*

The analysis of game selection according to age and sex is rendered difficult due to the scarcity of remains where both of these variables can be



analyzed. Only three game species have provided some data on the subject.

### Red deer

The high frequencies of sub-adult and adult animals in the samples indicates a selection of specimens, most probably males, before reaching reproductive age (i.e., 5-6 years). In the sample from Baia, among the identified remains, two mandible fragments are from individuals under two and a half years of age. Only in one of these could the age be estimated. In this case the individual is thought to be approximately one year old, since the  $M_1$  was on the verge of erupting. In the other case a  $dp_4$  does not allow one to proceed beyond a loose cohort level (i.e., sub-adult). In Noviodunum/Isaccea, six individuals have been identified: one one-year old ( $M^2$  erupting); one one-year-and-a-half old ( $P_2$  erupting); one two-years old ( $M_3$  erupting); one three/four-years old ( $M_3$  with slight wear), and two six/seven-years old ( $M_3$  medium worn). In the assemblages of Carsium/Harsova, Piua Petrii and Oradea, epiphyseal fusion data reveal the presence of, respectively, two, one and one adult individual. In the case of Oradea, a second individual of no more than two years (i.e., deciduous  $P_4$  still present) has been recorded.

Concerning data on sex, and although red deer antlers are present in all of the archaeozoological assemblages, only rarely can they be unequivocally attributed to hunted animals. Most of these could well represent naturally fallen antlers that were gathered in order to be processed.

### Wild boar

For the most part, wild boar remains derive also from adult animals, (i.e., over two years of age). Because of the difficulty of setting apart young wild boars from young pigs, it is impossible to specify whether the suids found were hunted or not. For the individuals around the immature-mature threshold (i.e., around one year), the distinction between the two groups was accomplished through size differences (i.e., biometry).

At Baia, among the specimens attributed to the wild boar we find two humeri bearing traces of the proximal cartilage. In one of the specimens the proximal epiphysis was lost, suggesting an age of Archaeofauna 19 (2010): 121-131

less than three-years-and-a-half, whereas in the other case the epiphysis was only partially ossified, indicating an age of approximately three-years-and-a-half. The remaining specimens represent adult individuals. In Siret, two individuals were definitely adult, and both Noviodunum/Isaccea and Oradea featured three additional adults each. At Carsium/Harsova one approximately one-year old individual was recorded on the basis of epiphyseal fusion data.

When determining sex, the morphometrical criterion of the canine teeth was the only one taken into account for the wild boar, since at the level of the postcranial skeleton no significant size differences have been noticed that would indicate male or female. At any rate, we only possess a few scattered data, with an isolated identification of three males and a female from Baia, two males and a female in Noviodunum/Isaccea, and one or two males and a female at Oradea.

### Roe deer

It has been assumed that the hunting of roe deer was probably similar to that of the red deer. In Baia one adult and one sub-adult individuals feature the following dental elements: an  $M_2$  with signs of incipient wear (estimated age: one-year-and-a-half), and a moderately eroded  $M_3$  (estimated age: 3-4 years). In Carsium/Harsova, two individuals provide age data based on their dentition and epiphyseal fusion: a  $dp_4$  (no more than two years) and a fused proximal end of the femur (more than two years).

As for the remaining game taxa, adult individuals generally represent most of those few with age assigned to them. This includes the hare identified in Baia, the fox from Carsium/Harsova, the otter from Noviodunum/Isaccea, the aurochs in Baia, Siret and Noviodunum/Isaccea, and the bear in Baia.

### CONCLUSIONS

The present synthesis focused on Romanian game mammals during the Middle Ages reveals, first of all, that hunting was a regular practice, whose economic importance shifted both in time and space. Most of the analysed sites exhibit a rather low proportion of wild mammals, but these are the

exceptions. In this way, the sites from the VI-XIII<sup>th</sup> centuries period in Banat evidence an intensification of hunting, suggesting a larger contribution of the wild species to the diet. Several restrictions against the hunting of wild species, introduced especially during the second half of the 2<sup>nd</sup> millennium A.D. encouraged husbandry practices and placed hunting on a marginal level in terms of meat procurement. Consequently, game animals diminish in the archaeological records from all regions. Likewise, our data and those from historical sources indicate that hunting was practiced because of both social and non social reasons as the data from military assemblages in Dobrogea demonstrate.

Red deer and wild boar have systematically been the most frequent game throughout time and space. Our comparative analyses reveal that the faunal spectra were more diverse in the Dobrogea region, where up to 15 species have been identified.

One presumes that anthropic pressure became more intense towards the second half of the 2<sup>nd</sup> millennium A.D., generating changes at the level of the vegetation cover that the faunal spectra translate into a gradual reduction through time in the distribution of several species, such as red deer and bear. An excess of hunting, combined with forest clearance and other environmental pressures brought about by rising numbers of the human population must also lie at the base of this reduction in the distribution ranges of most mammalian species. Eventually this resulted in the extinction of some such as the bison, the aurochs, and the beaver, a list that might eventually incorporate the elk.

Very few data on age and sex hint at the selection of game species on the assemblages. Our preliminary data suggests that this selection mainly focused on age, with most of the game species generally being represented by adult individuals.

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