

Late Holocene avian remains from the localities of the Roman period in Bulgaria

Zlatozar BOEV

BOEV Z. 2006. Late Holocene avian remains from the localities of the Roman period in Bulgaria - *Historia naturalis bulgarica*, **17**: 109-123.

Abstract. The full taxonomic list of the avifaunas of 14 both human (towns, villas, castles, caves, etc.) and non-human sites from the Roman period in the present day Bulgarian lands is presented. The examined material consists of 2736 bone remains of at least 422 individuals. The species composition includes 86 taxa (of 14 orders), six of them, *Pelecanus onocrotalus*, *Gypaetus barbatus*, *Phasianus colchicus* (the native autochthonic subspecies, *P. c. colchicus*), *Grus grus*, *Otis tarda*, and *Tetrax tetrax*, disappeared from the present day country's breeding avifauna. Five forms of domesticated birds (*Anser anser domestica*, *Anas platyrhynchos domestica*, *Gallus gallus domestica*, *Pavo cristatus domestica*, and *Columba livia domestica*) have been established. The remains of domestic fowl prevail in most of the sites.

Key words: Subfossil birds, Late Holocene avifaunas, Bulgaria, Roman epoch, peafowl

Introduction

The Late Holocene avifauna of the human and non-human sites dating back to the Roman period (2nd century B. C. - 4th century A. D) in Bulgaria has remained relatively poorly known with few exceptions (BOEV, 1991a, 1993a, 1996a,b,c, 1997a). The examination of only one site (Nicopolis-ad-Istrum) is more detailed (BOEV, 1991b; in press). The present paper summarizes all the available data so far on the avian remains and tries to trace the first stages of the synanthropization of birds throughout the country. It also lists for the first time the associated animal species of other groups uncovered in the examined sites.

Material and methods

The avian finds of the Roman sites of Bulgaria were collected during a large period between 1957 and 1999. They number 2736 bone fragments and bones of at least 422 individuals (Table 1). The great majority of them (85.62 per cent of the finds and 71.09 per cent of the individuals) come from Nicopolis-ad-Istrum, the richest ornitho-archaeological site of Bulgaria. All finds are kept in the Fossil and Recent Birds Department of the National Museum of Natural History, Bulgarian Academy of Sciences, Sofia (NMNHS). Most of them are identified through the comparative avian osteological

Table 1
Taxonomic composition, number of finds and the MNI of the avian remains from the localities of the Roman period in Bulgaria

No. Species		Sites														Total MNI	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	number of finds	MNI
	Kabyle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2
	Orphey															3	4
	Peshterata na strelite Cave															6	7
	Gledachevo															8	9
	Nicopolis-ad-Istrum															10	11
	Kostinbrod															12	13
	Abritus															14	15
	Armira															16	17
	Ratiaria															18	19
	Preslavets															20	21
	Malak															22	23
	Byalata Voda															24	25
	Arbanas															26	27
	Zelenigradska Cave															28	29
	Filipovska Cave															30	31
	Total number of finds	1	2	3	4	5	6	7	8	9	10	11	12	13	14	29	30
	MNI	1	2	3	4	5	6	7	8	9	10	11	12	13	14	28	29
																Gaviiformes	
1.	<i>Gavia cf. arctica</i>															1	1
																Podicipediformes	
2.	<i>Podiceps cristatus</i>															1	1
																Pelicaniformes	
3.	<i>Pelecanus onocrotalus</i>																1
4.	<i>Pelecanus onocrotalus/crispus</i>															1	1
5.	<i>Phalacrocorax carbo</i>															1	1

No. Species	Sites																																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30										
59. <i>Tetrax tetrax</i>					1	1																									1	1								
	Charadriiformes																																							
60. <i>Larus</i> sp.				1	1		1	1																						2	2									
61. Charadriiformes fam.				1	1																									1	1									
	Strigiformes																																							
62. <i>Athene noctua</i>					2	2																								1	1	3	3							
63. <i>Strix aluco</i>					3	2																									3	2	2	2						
64. <i>Bubo bubo</i>								1	1	1	1																													
	Passeriformes																																							
65. <i>Hirundo daurica</i>																																		1	1	1	1			
66. <i>Erythacus rubecula</i>		1	1																																	1	1			
67. <i>Turdus ruficollis</i>				1	1																																1	1		
68. <i>Turdus merula</i>																																					1	1		
69. <i>Turdus</i> sp.																																					1	1		
70. <i>Passer domesticus</i>																																					3	2		
71. <i>Passer/Fringilla</i>																																					1	1		
72. <i>Fringilla coelebs</i>																																					2	2		
73. <i>Carduelis</i> cf. <i>cannabina</i>																																					1	1		
74. Fringillidae gen.																																					1	1		
75. <i>Sturnus vulgaris</i>																																						1	1	
76. <i>Garrulus glandarius</i>																																						1	1	
77. <i>Nucifraga caryocatactes</i>																																						1	1	
78. <i>Pyrrhocorax graculus</i>																																						1	1	
79. <i>Pica pica</i>																																						4	2	
80. <i>Corvus frugilegus</i>																																						4	2	
81. <i>Corvus corone</i>																																						5	3	
82. <i>Corvus monedula</i>																																						2	1	
83. <i>Corvus</i> sp.																																					5	3		
84. Corvidae gen.																																						1	1	
85. Passeres fam.																																						3	2	
86. Aves indet																																						11	3	
Total																																							2736	422

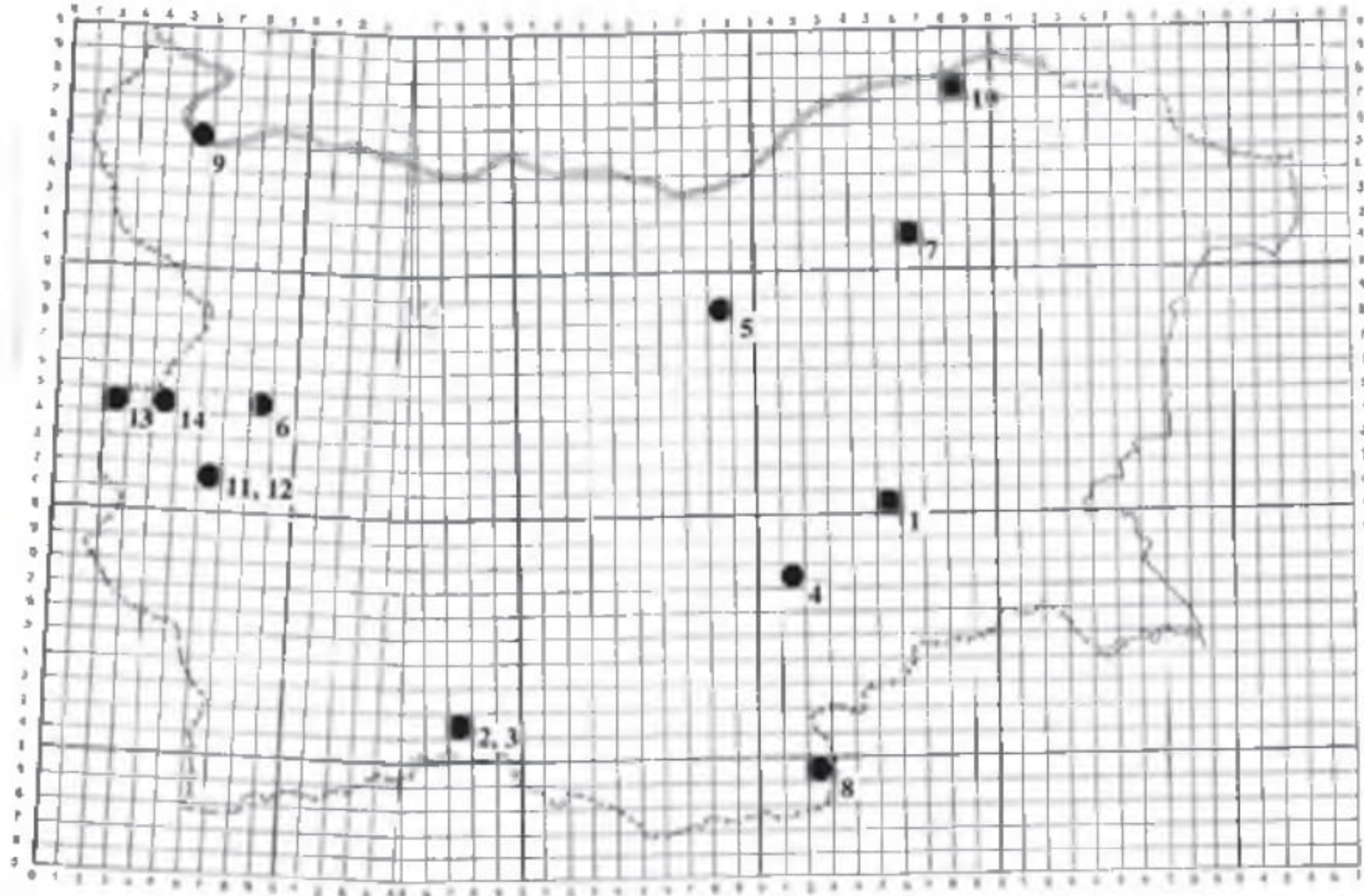


Fig. 1. Location of the Roman avian sites in Bulgaria: 1 - Kabile, 2 - Orphev, 3 - Peshterata na strelite, 4 - Gledachevo, 5 - Nicopolis-ad-Istrum, 6 - Kostinbrod, 7 - Abritus, 8 - Armira, 9 - Ratiaria, 10 - Malak Preslavets, 11 - Byalata voda, 12 - Arbanas, 13 - Zelenigradska Cave, 14 - Filipovska Cave.

collection of the NMNHS. All dates are given in accordance with the leaders of the archaeological excavations of the sites. The geographic location of the sites is given on the map of UTM-grid (LEHRER & DELTCSHEV, 1978) of 10-km squares (Fig. 1).

Short description of the sites

1. Kabile. MH 50. Ancient town from the Hellenic period (2700 B. C.), Roman and Early-Medieval settlement (up to 6 century A. D.), 2 km N of the Kabyle village (Yambol Region), 150 m a. s. l. Dates: square 44 P - 3-1 century A. D.; Sector 5 (farm building): 1-4 century A. D.; Sector 2 (Roman thermae): 2-4 century A. D.; Sector 3 (more elevated part of the town): 4-5 century A. D. Excavations of Prof. Velizar Velkov (1972-1989). Associated fauna: 1) Wilde: *Unio pictorum*, *Planorbarius corneus*, *Helix pomatia*, *Testudo* sp., *Cyprinus carpio*, *Lucioperca lucioperca*, *Silurus glanis*, *Esox lucius*, *Castor fiber*, *Lepus capensis*, *Sus scrofa*, *Cervus elaphus*, *Cervus dama*, *Capreolus capreolus*, *Bos primigenius*, *Mustela nivalis*, *Mustela putorius* (RIBAROV, 1991); *Cyprinus carpio*, *Esox lucius*, *Perca fluviatilis*, *Scardinius erythrophthalmus*, *Silurus glanis* (RIBAROV, 1994); *Lacerta* sp., *Anodonta cygnaea* (RIBAROV, 1982), *Sciurus vulgaris* (RIBAROV, 1991). 2) Domestic: *Sus scrofa domestica*, *Bos taurus*, *Equus caballus*, *Ovis aries*, *Capra hircus*, *Canis familiaris*. The material was collected by Dr. Georgi Ribarov (Port Burgas Museum). Material: 1562-1566; 1570-1582; 2709-2753; 2941-2944; 6398-6421; (1-34); (118-208); (980-993); (2336-2443). The composition of the bird fauna has been studied by BOEV (1997b), BOEV & RIBAROV (1993) and BOEV (1991c, 1996a,b).

2. Orpheus. KG 71. A small cave (rock niche) near to the "Orpheus" chalet, 2 km NE of Borino village (near the town of Devin, Smolyan region). Date: Late Holocene (up to Roman period). 650 m a. s. l. The material was collected by Dr. Vassil Popov (Institute of Zoology, BAS). After it had been determined and published (BOEV, 1992), the find of *Turdus ruficollis* was very likely lost.
3. Peshterata na strelite Cave. KG 71. A cave in the "Kastrakli" locality near the Borino village (near the town of Devin, Smolyan region). 900 m a. s. l. The material was accumulated by owls. It was collected and dated back to the Roman period by Dr. V. Popov. Associated fauna: *Mesocricetus newtoni* (V. Popov, unpubl. data). Material: 6521-6522; 11430-11432.
4. Gledachevo. MG 17. A Roman settlement in the "Pchelina" locality near Gledachevo village (Sliven District). 1-4 century A. D. Excavations of Dr. Gergana Sheyleva (1997-1998). Material: 12571-12576.
5. Nicopolis-ad-Istrum. LH 88. A Roman town, 3 km SE of the Nikyup village (Veliko Tarnovo Region), 350 m a. s. l., 1-6 century A. D. Excavations of Dr. Andrew Poulter (joint Bulgarian-British Archaeological Mission, 1984-1989) and Prof. Teophil Ivanov. The great majority (over 20 000 finds) of the archaeozoological material belongs to large domestic and wild mammals (BEECH, in press). Material: 942-983; 1104-1107; 1290; 1423; 1645; 3057-3059; 4053-6327; 11468. The preliminary composition of the bird fauna was published by BOEV (1991b, 1996a,b, in press).
6. Kostinbrod. FN 84. An ancient villa (residence) of the Roman Emperor Constantin I (Constantine the Great). Late 3rd - early 4th century A. D. Depth: 0,85 m. Sector V, south wall. Excavations of Dr. Violeta Bozhilova (1973-1978). Material: 1194 (BOEV, 1996a).
7. Abritus. MJ 61. A Roman castle, probably a military camp (MARINOVA, 1995), 2 km SE of the town of Razgrad on the Beli Lom river bank. 500 m a. s. l. 1-6 century A. D. The collected avian material was dated back to the 3-4th century A. D. Excavations of Prof. Stefan Ivanov. The material was submitted for examination by Dr. Nicolay Iliev. Associated fauna: *Lepus capensis*, *Sus scrofa domestica*, *Bos taurus*, *Cervus elaphus*, *Capreolus capreolus*, *Canis familiaris* (unpubl. pers. data). Material: 1460-1477 (BOEV, 1996a).
8. Armira. MF 29. A Roman villa near the town of Ivaylovgrad. 350 m a. s. l. 3 century A. D. Excavations in 1982-1988. The material was submitted for examination by Dr. Lazar Ninov (Archaeological Institute and Museum, BAS). Material: (1362-1363) (BOEV, 1996a).
9. Ratiaria. FP 55. A Roman town, 1,5 km NW of the Archar village (Vidin region), 100 m a. s. l. 1-6 century A. D. Excavations in 1957-1961 and the joint Bulgarian-Italian Archaeological Expedition in 1975-1980. The material was collected in 1989 and 1993 and dated back to the 3-4th century A. D. Associated fauna: *Unio* sp., *Silurus glanis*, *Cyprinus carpio*, *Emys orbicularis*, *Bos taurus*, *Ovis aries*, Ovicaprinae sp. indet., *Sus scrofa domestica*, *Equus caballus ferrus*, *E. asinus*, *Canis familiaris*, *Felis catus*, *C. elaphus*, *C. capreolus*, *Sus scrofa* (ILIEV et al., 1993; BOEV, 1991a, 1996a). Material: 1482-1484; 3173-3216; 3753-3765; 12 535-12 538.
10. Malak Preslavets - 2. MJ 87. A Roman settlement near the Malak Preslavets village (Silistra region). 50 m a. s. l. 3-4 century A. D. Excavations of Dr. Ivan Panayotov. Material: (2220-2225); (2228).
11. Byalata Voda. FN 61. A Late Ancient fortified villa on the Struma river bank in the Byalata Voda locality between the towns of Pernik and Radomir. 600 m a. s. l. Later an Early Byzantine settlement appeared over its ruins. 3-early 6 century A. D. Excavations of Dr. Venetsiya Lyubenova. Associated fauna: *Unio* sp., *Silurus glanis*, *Cyprinus carpio*, *Bos taurus*, *Ovis aries*, *Capra hircus*, *Sus scrofa domestica*, *Equus caballus*, *E. asinus*, *Canis familiaris*, *Felis catus*, *Cervus elaphus*, *Sus scrofa*, *Vilpes vulpes*, *Martes foina*, *Lepus capensis*, *Rattus* sp. (BOEV, 1996a,b; ILIEV et al., 1992). Material: 3012-3016; 3147-3172; 6562-6564; 11475.

12. Arbanas. FN 61. A small settlement with an adornment workshop. 550 m a. s. l. Mid 3 century A. D. (BOEV, 1997). Excavations of Dr. Venetsiya Lyubenova in 1989-1990. Material: 1299; 3217-3339. Bird remains have been published by BOEV (1997c).

13. Zelenigradska Cave. FN 24. 1,5 km NW of the Zelenigrad village near the town of Tran (Pernik region). 1400 m a. s. l. 2-4 century A. D. The material has been dated by Dr. Gergana Kabakchieva (Archaeological Institute and Museum, BAS). Associated fauna: *Lepus capensis*, *Vulpes vulpes* (unpubl. pers. data). Material: 2886; 2888-2889; 2899-2904; 3742-3752; 8004-8014; 11443. The bird remains have been studied by BOEV (1996a; 2001).

14. Filipovska Cave - 2. FN 44. 1,5 km NW of the Filipovtsi village near the town of Tran (Pernik region). 850 m a. s. l. Sounding at 10-12 m from the cave entrance at 0,3-0,4 m depth. 2-4 century A. D. The material has been dated by Dr. G. Kabakchieva. Associated fauna: *Glis glis*, *Lepus capensis*, *V. vulpes*, Chiroptera indet. (unpubl. pers. data). Material: 651-655; 2659-2676. The bird remains have been published by BOEV (1996) under the former name of the cave, Mislovishka, and by BOEV (2001).

Results and Discussion

Taxa representation

A complete list of Late Holocene bird fauna of the Bulgarian Roman sites is presented for the first time. A total of 78 taxa are established (Table 1), six of them have disappeared throughout the country as breeding species. Twenty species are now threatened with total extinction in Bulgaria and they are listed in the national Red Data Book (BOTEV & PESHEV, 1985): *Gavia arctica*, *Pelecanus onocrotalus*, *Phalacrocorax carbo*, *Cygnus olor*, *Anser anser*, *A. albifrons*, *Anas strepera*, *Tadorna tadorna*, *Gypaetus barbatus*, *Gyps fulvus*, *Circaetus gallicus*, *Milvus milvus*, *Accipiter gentilis*, *A. nisus*, *Falco cherrug*, *Phasianus colchicus*, *Otis tarda*, *Tetrax tetrax*, *Grus grus*, and *Columba oenas*.

The bird composition comprises 15 orders (Gaviiformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Anseriformes, Accipitriformes, Falconiformes, Galliformes, Gruiformes, Charadriiformes, Columbiformes, Caprimuliformes, Strigiformes, Apodiformes, and Passeriformes), represented by 21 recent families and 45 genera. In most of the sites best represented are three major groups - the water birds (mainly waterfowl), the game fowl and the diurnal raptors.

Discussion on the subfossil record of some rare species

White pelican

The rostral fragment of the White Pelican (*Pelecanus onocrotalus* Linnaeus, 1758) from Kostinbrod (NMNHS 1194; Fig. 2) is one of the best ornitho-archaeological finds in Bulgaria. It was discovered in the foundations of a villa of the Roman Emperor Constantine the Great from the end of the 3rd - early 4th century A. D. Its measurements are as follows: length - 29,0 cm, maximum width - 5 cm, and maximum thickness in the proximal part - 1,3 cm. The White pelican is also known from Urdoviza (3000-2000 B. C.) and Krivnya (9-10 century A. D.) (BOEV, 1999). It has been an extinct nesting species in Bulgaria since the 1950-ies.



Fig. 2. *Pelecanus onocrotalus*, NMNHS 1194 - os praemaxillare: left lateral view (above) and dorsal view (below) (Photograph: Boris Andreev)

The site lies far from the present breeding range of the species. In the non-breeding season separate individuals and groups still occasionally visit the large inland water bodies.

BRODKORB (1963) cites Pleistocene and Holocene records of this species in England and Switzerland. It is also known from the Late Holocene (400-2660 B. P.) of Wortel in Namibia (AVERY, 1984), the Antiquity in Olvia and Sarkel (VOINSTVENSKIY, 1960), Natouffian-Kiamian of Hatoula in Israel (PICHON, 1985a) and Late Paleolithic in the Nile Valley in Egypt (GAUTIER, 1988). Subfossil remains of pelicans from Bulgaria (*Pelecanus onocrotalus/crispus*) are established also in the Early Neolithic site in the town of Kazanlak (6000-5000 B. C.; KOVACHEV, 1988 /pers. identifications;/ BOEV, 1993b) and Nicopolis-ad-Istrum (NMNHS 5877, (1791)).

Lammergeier

The Lammergeier (*Gypaetus barbatus* (Linnaeus, 1758)) is known from Nicopolis-ad-Istrum (NMNHS 5569; Fig. 3), Kazanlak (KOVACHEV, 1988 /pers. identifications;/ BOEV, 1993b) and Pliska, the medieval capital of Bulgaria (10 century A. D.), 1289. This species disappeared from the Bulgarian fauna in the 1960-ies and for the last 45 years there have been only six records of wandering birds.

BRODKORB (1964) lists Pleistocene and Holocene records of *G. barbatus* from Belgium, Spain, Monaco, Hungary and China. In addition TYRBERG (1998) lists Late Pleistocene records from Switzerland, France, Germany, Greece, Iraq, Italy, and Romania. The species is also known from the Holocene of Holodniy Grot Cave in Georgia (BENDUKIDZE, 1979).



Fig. 3. *Gypaetus barbatus*, NMNHS 5569 - radius dex.: right lateral view (Photograph: Boris Andreev)

Saker Falcon

The Saker Falcon (*Falco cherrug* Gray, 1834). The only Holocene find of that species in Bulgaria came from Kabyle (NMNHS 1562). The site lies out of the present breeding species' range. Recently the Saker falcon has been established as prey for *Bubo bubo* in the vicinity of the site (Dr. Boyan Milchev, unpubl. data).

The species is known from the antiquity in Olvia and Sarkel in S Ukraine (VOINSTVENSKIY, 1960) and in the Shandaja Cave in Istria (Croatia), 25 340 - 10 830 B. C. (MALEZ & MALEZ, 1982). Other Late Pleistocene records are listed by TYRBERG (1998) from China, Cyprus, Hungary, Slovenia and Ukraine.

Indian peafowl

The Indian peafowl (*Pavo cristatus* Linnaeus, 1758) is possibly the only bird in the Roman site, which was present there due to its decorative value. It is represented by a single find of excellent preservation, synsacrum, pars acetabularis dex., NMNHS 1290 (Fig. 4). The find represents an adult male specimen. The development of the bone sculpture and dimensions clearly distinguish it from the remaining large representatives of Galliformes (*Tetrao urogallus*, *T. tetrrix*, *M. gallopavo*, *Ph. colchicus* and *G. gallus*) and completely correspond to the homologous skeletal elements of the comparative specimens of *P. cristatus*, NN NMNHS 1/1982, 2/1990, 3/1990, and 4/1996.

No remains of *P. cristatus* have been found in Bulgaria so far and this find is of great significance. It was dated back to the 4th century A. D. and it is the first reliable proof of the breeding (keeping) of peafowls in the large Roman cities in Bulgaria. The numerous bas-relieves of peafowl have suggested the species's presence in the Roman times throughout the country, but osteological remains have not confirmed them so far.

BOGDANOV (1937) notes that the peafowl is a result of an ancient domestication, but it is the only domesticated bird that has not been, both morphologically and dimensionally changed. Actually



Fig. 4. *Pavo cristatus* f. *domestica*, NMNHS 1290 - synsacrum, right acetabular fragment: right lateral view (Photograph: Boris Andreev)

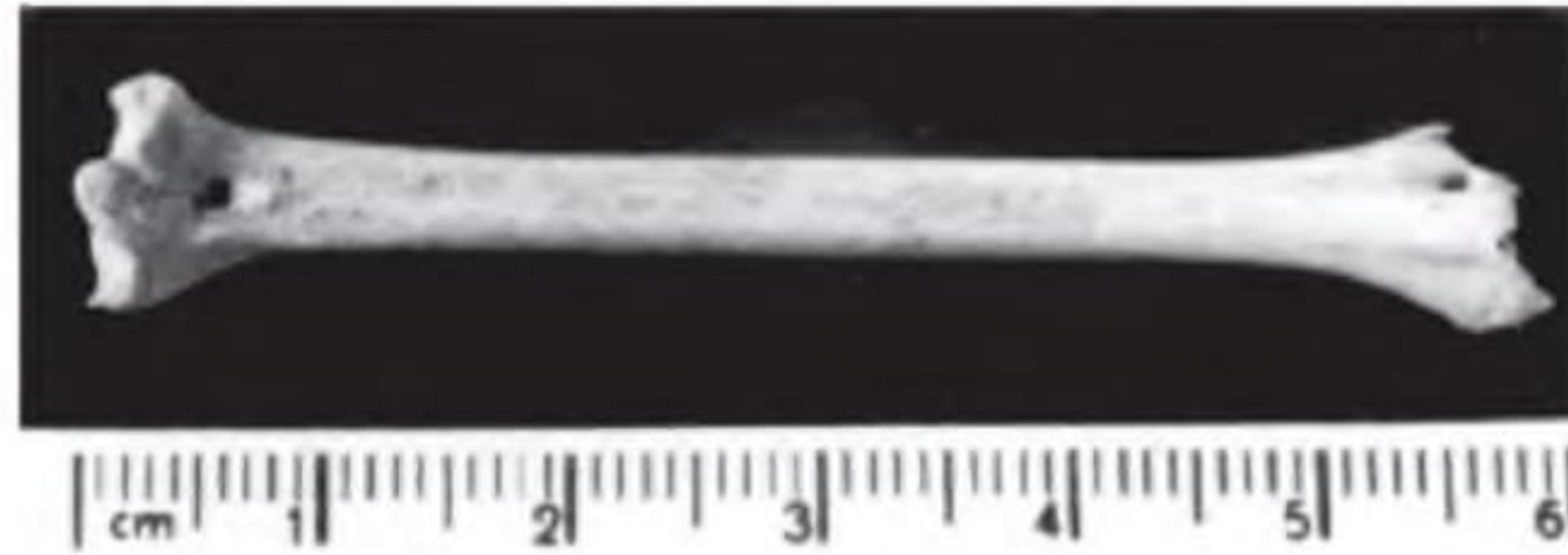


Fig. 5. *Tetrax tetrax*, NMNHS 978 – tarsometatarsus sin.: cranial view (Photograph: Boris Andreev)

P. c. domestica is completely identical with its wild ancestor. We could explain that fact by the subordinate role of its meat-resource importance to its decorative value. The appearance of the Indian peafowl in Europe is attributed to the Phoenicians during the rule of Tzar Salomon (1020-980 B. C.) (GRAHAME, 1984). The earliest documented breeding of that species is known from the neighbouring Greece (BOGDANOV, 1937). The peafowl has been brought from the Asia Minor and in the 5th century B. C. it was a common domestic bird in Athens.

For more than 3000 years the peafowl has been present in the arts, legends, literature and the religion traditions. The Romans were the first (around 1 century A. D.), who bred *P. cristatus* for its delicious meat (BOGOLYUBSKIY, 1959). From the Roman Empire the peafowl spread to present France, Great Britain and many other European countries. In the Early Christian period the peafowl was a symbol of the rise of Christ and the bird was often pictured on the walls, mosaics and facades of the churches (GRAHAME, 1984). A series of similar images and bas-reliefs of various archaeological sites of the Roman epoch (and later) from all over the country are kept at our disposal (author's unpubl. data).

The Indian peafowl is known from very few localities in Europe: "Holocene" from Poland (BOCHENSKI, 1974); Roman epoch (15-31 A. D.) in the fortress of Velen I in Holland (PRUMMEL, 1987; 1993); 12 century A. D. in the medieval town of Volkovisk in Belorussia (the ancient-most find of all NE Europe and N Asia; BURCHAK-ABRAMOVICH & ZVERUGO, 1969), and 1350-1520 A. D. in London (BRAMWELL, 1975).

Little Bustard

The only Holocene record of the Little Bustard (*Tetrax tetrax* (Linnaeus, 1758)) from Bulgaria came also from Nicopolis-ad-Istrum (NMNHS 978; Fig. 5). The site lies beyond the present breeding range of the species (BOEV, 2003).

The Holocene records are known from: Don Valley between Novocherkask and Nizhne-Cherskaya and Crimea (DEMENTIEW, 1960); medieval Sarkel in Ukraine (VOINSTVENSKIY, 1966); 6000-8000 B. P. in Moldova (VERINA, 1960); Eneolithic in Brynzeni I; 4000 B. P. in Novie Ruseshti (GANJA, 1972); Epipaleolithic (Natoufian) of Mallaha in Palestine (PICHON, 1987); 28 000 to 4000 B. C. in S France and N Spain (VILETTE, 1983); Holocene in the Aruhlo Cave in Georgia (BENDUKIDZE, 1979).

Black-throated Thrush

The Black-throated Thrush (*Turdus ruficollis* Pallas, 1776) is established by a synsacral fragment preserving corpora vertebrorum (BOEV, 1992). The find has been compared to eight European thrushes and both in size and morphology it can be referred to that species. *T. ruficollis* has been established twice in the recent avifauna of Bulgaria as a rare vagrant visitor. Its occurrence in the other parts of Europe is also very rare. The site is situated far from the present breeding range of the species.

The Black-throated Thrush has been reported from the Middle Pleistocene of the Medvezhaya Cave in N Ural Mts., Russia and from the Middle and Late Choukoutien (Zhoukoudian), E China (TYRBERG, 1998).

Conclusions

The Bulgarian avian records of the human and non-human sites of the Roman period are rich and diversified. They are an integrated and important part of the Late Holocene record of the bird fauna of Europe and contribute to its understanding and interpretation.

The wild avian fauna was diversified and has played an important role in the economy of the population. On the other hand, the remains of wild birds allow us to trace the main stages of the synanthropization process ca. 2000 years ago.

The Domestic bird fauna has been established in its definite (modern) type and enumerates at least 5 domestic birds.

The site of Nicopolis-ad-Istrum is the richest in avian remains Roman site of Bulgaria, and one of the richest ancient sites known until now on the Balkans.

Two species (*Pavo cristatus* and *Turdus ruficollis*) of the Bulgarian subfossil records are known only from the localities of the Roman period.

Acknowledgements

The author thanks all the people who contributed avian bone material for examination, and provided additional data for its dating. The study was partially sponsored by the NMNHS and the Bulgarian National Science Fund (project No NI B-202/01.10.1992).

References

- AVERY G. 1984. Late Holocene avian remains from Wortel, Walvis Bay, SWA/Namibia, and some observations on seasonality and Topnaar Hottentot prehistory. - *MADOQUA*, **14** (1): 63-70.
- BEECH M. In press. The Mammal Bones. - In: A. Poulter (ed.) *Nicopolis-ad-Istrum, a Late Roman and Byzantine City in north central Bulgaria*. Vol. 3 - The Environmental Finds.
- BENDUKIDZE O. 1979. The Holocene vertebrate fauna of Georgia. Metsniereba Publ. House, Tbilisi, 1-106.
- BOCHENSKI Z. 1974. *Ptaki Młodszeo Czwartorzedu Polski*. Warszawa, PWN, 1-211.
- BOEV Z. 1991a. Investigations of the birds from the archaeological sites of Bulgaria. - *Priroda*, **1**: 35-39. (In Bulgarian).

- BOEV Z. 1991b. The birds of the Roman town Nicopolis-ad-Istrum (2nd-6th century) at Nikjup, Lovech Region. – *Hist. nat. bulgarica*, **3**: 92-102 (In Bulgarian).
- BOEV Z. 1991c. Waterfowl in Ancient Bulgaria. – In: Queiroga F., Dinis A.P. (Eds). *Paleoecologia e Arqueologia II*. Vila Nova de Famalicao, 111-120.
- BOEV Z. 1992. Paleornithological studies in Bulgaria. – *Natural History Museum of Los Angeles County, Los Angeles, Science Series*, **36**: 459-463.
- BOEV Z. 1993a. Archaeo-ornithology and the synanthropisation of birds: a case study for Bulgaria. – *Archaeofauna*, **2**: 145-153.
- BOEV Z. 1993b. Neolithic birds of the prehistoric settlement of Kazanlak. – *Hist. nat. bulgarica*, **4**: 57-67. (In Bulgarian).
- BOEV Z. 1995. On the appearance of the domestic fowl (*Gallus gallus domestica*) in Bulgaria and Balkan peninsula and the question of the domestication of Junglefowls (Genus *Gallus* Brisson, 1760) in Southeast Europe. – *Hist. nat. bulgarica*, **5**: 37-49.
- BOEV Z. 1996a. The Holocene avifauna of Bulgaria (A review of the ornitho-archaeological studies). – *Hist. nat. bulgarica*, **6**: 59-81.
- BOEV Z. 1996b. Gamefowl in Bulgaria over the last 8,000 years. – In: Botev N. (Sen. ed.) *Proceedings of the Internat. Union of Game Biologists. XXII Congress "The Game and the Man"*, Sofia, Bulgaria, September 4-8, 1995. Pensoft Publ., Sofia - Moscow - St. Petersburg, 398-401.
- BOEV Z. 1996c. Raptors and Owls (Aves: Falconiformes et Strigiformes) in the Archaeological Record of Bulgaria. – *Hist. nat. bulgarica*, **6**: 83-92.
- BOEV Z. 1997a. Ornithoarchaeology in Bulgaria: development and results. – *Archaeologia bulgarica*, **1** (2): 71-80.
- BOEV Z. 1997b. Wild Galliform and Gruiform Birds (Aves, Galliformes and Gruiformes) in the Archaeological Record of Bulgaria. – *Osteoarchaeology*, **7**: 430-439.
- BOEV Z. 1997c. The birds of the Roman settlement of Arbanas - 1 near Pernik. – *Hist. nat. bulgarica*, **7**: 28 (In Bulgarian).
- BOEV Z. 1999. Neogene and Quaternary birds (Aves) from Bulgaria. National Museum of Natural History, Bulgarian Academy of Sciences, Sofia. D. Sci. thesis. 243 pp. + 243 pp. supplements (In Bulgarian).
- BOEV Z. 2001. Late Pleistocene and Holocene avifauna from three caves in the vicinity of Tran (Pernik District - W Bulgaria). – In: Delchev P., Shanov S., Benderev A. (Eds). *Karst. Vol. I. Proceedings of the First National Conference on Environment and Cultural Heritage in Karst*. Sofia, 10-11 November 2000. Earth and Man National Museum. Association of Environment and Cultural Heritage in Karst. Sofia, 98-106.
- BOEV Z. 2003. Distribution of the Little Bustard (*Tetrax tetrax* /Linnaeus, 1758/) and Great Bustard (*Otis tarda* Linnaeus, 1758) (Aves: Otididae Gray, 1845) in Bulgaria during the Late Pleisocene and the Holocene. – *Ann. Univ. Sofia "St. Kliment Ochridski". Facultu de Biologie. Sofia. Livre 1 - Zoologie*, **93-94** (2002): 41-47.
- BOEV Z. (in press). The Bird Bones. – In: Poulter A.G. (ed.). *Nicopolis-ad-Istrum, A Roman, Late-Roman and Byzantine City*. vol. 3. Roman Society: London.
- BOEV Z., RIBAROV G. 1993. Birds from the ancient town of Kabyle (1st millennium B.C. - 6th century A.D.) near Kabyle (Bourgas District). – *Hist. nat. bulgarica*, **4**: 68-77 (In Bulgarian).
- BOGDANOV E. 1937. The Peacock. – In: *The Origin of domestic animals*. Sel'chozgiz Publ. house, Moscow, p. 317. (In Russian).
- BOGOLYUBSKIY S. 1959. Ornamental birds. In: *The origin and transformation of domestic animals*. Sovetskaya Nauka Publ. House, Moscow, 567-569 (In Russian).

- BOTEV B., PESHEV T. (eds.) 1985. The Red Data Book of the People's Republic of Bulgaria. Volume 2. Animals. Publ. House of the Bulg. Acad. of Sci., Sofia, 1-184 (In Bulgarian).
- BRAMWELL D. 1975. Bird Remains from Medieval London. – *The London Naturalist*, **54**: 15-20.
- BRODKORB P. 1963. Catalogue of fossil birds. Part 1. – *Bull. Florida State Mus., Biol Sci. Gainesville*, **7** (4): 182-293.
- BRODKORB P. 1964. Catalogue of fossil birds. Part 2. – *Bull. Florida State Mus., Biol Sci. Gainesville*, **8** (3): 195-335.
- BURCHAK-ABRAMOVICH N. I., ZVERUGO Y. G. 1969. Towards the exploration of the ornithofauna of the ancient [town of] Volkovisk. – In: Abstracts of the Archaeol. Conf. of Belorussia. Inst. of History of the Acad. of Sci of Belorussian Sov. Soc. Rep., Minsk, 216-223 (In Russian).
- DEMENTIEW G. P. 1960. Espèces aviennes récentes trouvées à l'état fossile au post-tertiaire dans l'URSS. – In: Berlioz J. (ed.) 12-th International Ornithological Congress. Helsinki 5-12.VI. 1958. Proceedings, Vol. I. Helsinki, 162-166.
- GRAHAME I. 1984. Peafowl. – In: Mason, I. L. (ed.) *Evolution of domesticated animals*. London, New York, Longmann, 315-319.
- GAUTIER A. 1988. L'exploitation saisonnière des ressources animales pendant le paléolithique supérieur dans la vallée du Nil égyptien. – *Anthropozoologica*, 2nd No spec.: 23-26.
- KOVACHEV G. 1988. The wild and domesticated animals of the Neolithic settlements near Kazanluk, Rakitovo and Kalugerovo, osteoscopic and osteometric examinations. Higher Institute of Zootechnic and Veterinary Medicine. Synopsis of D. Sci. thesis dissert., Stara Zagora, 1-36 (In Bulgarian).
- ILIEV N., BOEV Z., SPASSOV N. 1992. Restes osseux d'animaux de la villa de l'époque antique basse et de la localité de l'époque byzantine dans le quartier Bela voda, district de Pernik. – *Arheologiya*, **1**: 44-53 (In Bulgarian).
- ILIEV N., BOEV Z., SPASSOV N. 1993. Ossements d'animaux de la ville romaine de Ratiaria (IIe - IVe s.) près d'Arcar, village de la région de Montana. – *Arheologiya*, **4**: 52-59 (In Bulgarian, French summary).
- LEHRER A., DELTCSHEV C. 1978. Modern Methods for Biogeographical Mapping of Bulgaria. – *Acta zool. bulg.*, **10**: 3-12 (In Bulgarian).
- MARINOVA E. 1995. Palaeobotanical research of the Roman Castellum Abritus. "St. Kliment Ohridski" Sofia Univ., Biol. Faculty, Dipl. work, 1-72+ suppl. (In Bulgarian).
- MALEZ M., MALEZ-BACIC V. 1974. The Upper Pleistocene ornithofauna of Sandalja I near Pua in Istria. – *Bull. Sci, Sect. A, Zagreb*, **19** (1-2): 6-8.
- PICHON J. 1985. Etude préliminaire de l'avifaune de Hatoula. – In: Lechevallier, M., A. Ronen. Rapport préliminaire. Les cahiers du Centre de Recherche Français de Jerusalem, 1. Le site Natoufien-Khiamien de Hatoula (près de Latroum, Israel). Fouilles 1980-1982, 99-102.
- PICHON J. 1987. L'avifaune de Mallaha. – In: Bouchud J. Desse (eds). La faune du gisement Natoufien de Mallaha (Eynan), Israel. M.T.J. 4. - Mémoires et travaux du C.R.F.J. Paléont. Paris, 115-150.
- PRUMMEL W. 1987. Poultry and fowling at the Roman castellum Velsen I. – *Palaehistoria*, **29**: 183-201.
- PRUMMEL W. 1993. Birds from four coastal sites in the Netherlands. – *Archaeofauna*, **2**: 97-105.
- RIBAROV G. 1982. New data on the fauna of the ancient town of Kabile. – *Bull. Mus. SE Bulgarie*, **6**: 31-41 (In Bulgarian).
- RIBAROV G. 1991. The fauna of Kabile (1st millenium B. C. to 6th century A. D.) according to the remains of the wild and domesticated animals. – In: Kabile, Vol. 2., Publ. House of the Bulg. Acad. of Sci., Sofia, 156-167 (In Bulgarian).
- TYRBERG T. 1998. Pleistocene birds of the Palearctic: a catalogue. – *Publ. of the Nuttall Ornithol. Club, Cambridge, Massachusetts*, No **27**: 1-720.

- VELKOV V. (Chief ed.) 1979. History of Bulgaria. Vol. 1. Primitive-communism system and Slave-holding system. Thracians. Sofia, Bulg. Acad. of Sci. Publ. House, 1-472. (In Bulgarian).
- VERINA V. 1960. Some features of the development of nature of Moldavia. "Kartya Moldovenske" State Publ. House, Kishinev, 1-112. (In Russian).
- VILETTE P. 1983. Avifaunes du Pleistocène final et de l'Holocène dans le Sud de la France et en Catalogne. Lab. Préhist. Palethnol., Carcassonne. – *Atacina*, 1: 1-194.
- VOINSTVENSKIY M. 1960. The birds of the steppe zone of the European part of the USSR. Kiev, Ukrainian SSR Acad. of Sci. Publ. House, 1-292 (In Russian).

Received: 24.09.2004

Author's address:

Dr. Zlatozar Boev
National Museum of Natural History
Tsar Osvoboditel Blvd. 1
1000 Sofia, Bulgaria
E-mail: boev@nmnh.bas.bg;
boevzaro@yahoo.co.uk

Късно-холоценски останки от птици от находища от римската епоха в България

Златозар БОЕВ

Представен е пълния таксономичен състав на авифауните от 14 находища (градове, вили, крепости, пещери и др.) от римската епоха в днешната територия на България. Изследваният материал възлиза на 2736 костни останки от 422 екз. птици. Представени са и кратка характеристика на находищата и целия състав на установената в тях съпътстваща фауна (и флора). Установени са 86 таксона (от 14 разреда), 6 вида от които (*Pelecanus onocrotalus*, *Gypaetus barbatus*, *Phasianus colchicus* (местният автохтонен подвид, *P. c. colchicus*), *Grus grus*, *Otis tarda*, и *Tetrax tetrax*), са изчезнали от съвременната гнездова авифауна на страната. Домашната фауна от птици е съставена от 5 форми (*Anser anser domestica*, *Anas platyrhynchos domestica*, *Gallus gallus domestica*, *Pavo cristatus domestica* и *Columba livia domestica*), сред които доминират останките от домашна кокошка. Находките от индийски паун и черногуш грозд са единствените досега в страната. Установеният видо-състав на съвременните синантропни и синурбани видове птици бележи ранните стадии на процеса на синантропизация на територията на днешна България.