Historia naturalis bulgarica,
17: 125-132, 2006

Early Pleistocene avifauna of Kunino (NW Bulgaria)

Zlatozar BOEV

BOEV Z. 2006. Early Pleistocene avifauna of Kunino (NW Bulgaria). – Historia naturalis bulgarica, **17**: 125-132.

Abstract. The Early Pleistocene (Vaalian-Menapian, approximately 1,2-1,0 m.y.a.) avian fauna is studied. The material includes 36 bone fragments of MNI 21 belonging to 11 taxa of three orders: Falconiformes: *Falco* sp. ex gr. *cherrug*, Falconiformes indet.; Galliformes: *Tetrao* cf. *urogallus*, *Tetrao tetrix/ Lagopus* sp., *Coturnix coturnix*, *Alectoris graeca*, Perdicinae gen., and Passeriformes: *Sylvia* cf. *atricapilla*, *Pyrrhocorax pyrrhocorax*, *Acanthis* cf. *cannabina* and *Coccothraustes coccothraustes*.

Key words: Fossil birds, Quaternary fauna, Early Pleistocene, Balkan Peninsula, Bulgaria

Introduction

The Early Pleistocene avifauna of Bulgaria is still poorly studied (BOEV, 1999). Only three localities (the Temnata Doupka Cave, the Cherdzhenitsa Cave, and Kunino (BOEV, 2001a), dated Early Pleistocene, are known and their avian remains were examined (BOEV, 1994; 2000a). The locality of Kunino was recently discovered (1998) and some preliminary data on the taxonomic composition of the avian record have been published by BOEV (2001a). The present paper aims to present all data on the fossil fauna of birds in that site, and to evaluate its significance to the palaeoecology of the region.

Material and Methods

The material was collected between 1998 and 2000 (on 25 July 1998, 13 September 1998, 28 September 1999, and 14 September 2000), by excavation, screening through a screen of 1,5 mm meshes, consequent washing, drying and laboratory extracting of the fossils. It is of bad preservation, highly damaged and fragmented. The finds have been determined through comparison with homologous skeletal elements of the specimens of the avian osteological collections of the National Museum of Natural History (Sofia; NMNHS), and the Natural History Museum, Tring, part of the Natural History Museum, London (former British Museum of Natural History, BMNH). The total material comprises (by October 1999) over 258 identifiable bone fragments and complete bones, mainly of terrestrial small mammals, ungulates, carnivores, and birds. All avian finds are kept at the Fossil and Recent Birds Department of the NMNHS. They number 36 bones and bone fragments: coll. No.: NMNHS 12210; 12298-12312; 12 547-12 557; 14 970-14 978 (Table 1).

Abbreviations: cmc – carpometacarpus, dex. – dextra, dig. – digitorum, dist. – distalis, later. – lateralis, prox. – proximalis, sin. – sinistra, tbt – tibiotarsus.

Table 1

Taxonomic list, collection numbers and MNI of the avian finds of the Early Pleistocene site near Kunino village

No	Taxa	Collection numbers (NMNHS) and skeletal elements	Number of finds	Minimum number of individuals (MNI)
		FALCONIFORMES		
1.	*Falco* sp. ex gr. *cherrug*	ulna sin. prox. 12311	1	1
2.	Falconiformes indet.	phalanx dist. dig. pedis 14975	1	1
		GALLIFORMES		
3.	*Tetrao* cf. *urogallus*	trabecula later. sterni 12312	1	1
4.	*Tetrao tetrix* /*Lagopus* sp.	tbt dex. dist. 12302	1	1
5.	*Coturnix coturnix*	humerus sin. dist. 12299, coracoid sin. dist. 14974	2	1
6.	cf. *Coturnix coturnix*	humerus dex. (diaphysal part, prox.) 14974	1	1
7.	*Alectoris graeca*	humerus dex. prox. 12309	1	1
8.	Perdicinae gen.	humerus dex. 14 978	1	1
		PASSERIFORMES		
9.	*Sylvia* cf. *atricapilla*	coracoid sin. dist. 14972	1	1
10.	*Coccothraustes coccothraustes*	cmc sin. prox. 12210	1	1
11.	*Acanthis* cf. *cannabina*	coracoid sin. dist. 14971	1	1
12.	*Pyrrhocorax pyrrhocorax*	cmc dex. dist. 12298, cmc sin. – digitus majus 12300	2	1
	Aves indet. (Non-Passeriformes)	humerus dex. (splinter) 12301, tbt prox. dex. 12303, tbt prox. dex. 12304, scapula sin. (caudal part) 12305, scapula dex. (caudal part) 12306, tbt dex. prox. 12307, tbt sin. prox. 12308, vertebra cervicalis 12310, femur sin (dyaphysal part) 12 547, femur sin. 12 548, phalanx digi. pedis prox. 12 549, phalanx I dig. pedis 12 550, phalanx dist. dig. majus 12 551, phalanx dig. pedis 12 552, os pterygoideum 12 553, radius (dyaphisal part) 12 554, os metacarpalis majus sin. 12555, femur dex. dist. 12 556, ulna sin (medial part) 12557, vertebra cervicalis – corpus 14970, tbt dex. (medial dyaphysal fragment, diameter - 6,2 mm) 14973, humerus dex. dist. (splinter) 14976, humerus dex. dist. 14 977	23	9
	Total		37	21

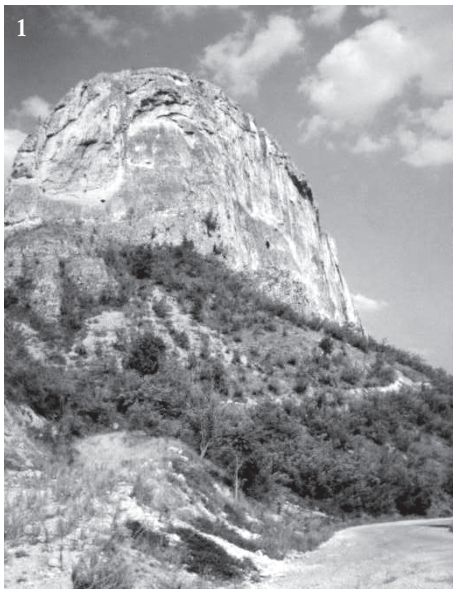

Fig. 1. Present landscape of the region of Kunino locality (25.07.1998, Photograph: Zlatozar Boev).
Fig. 2. The Kunino locality (25.07.1998, Photograph: Zlatozar Boev).

Short description of the site

The site represents an outcrop of a Sarmatian limestone massive (Fig. 1) in an exploring quarry (since 1971) (Fig. 2), 2 km NW of the Kunino village (Vratsa District, Montana Region, NW Bulgaria, UTM grid: GN 48 (Fig. 3), 250 m a. s. l. It was discovered by Mr. G. Hristov in 1998.

Assotiated fauna: Our collected material contains remains of *Testudo* sp., as well as numerous ones of *Lepus* sp., *Eguus* sp., *Cervus* sp., *Sus* sp., Lagomorpha, Felidae, Canidae, Bovidae, Microtinae, Murinae, Gliridae, and Chiroptera. All finds are unarticulated and highly broken. Part of the mammalian material examined by Dr. Nicolay Spassov (NMNHS) is referred to: *Panthera spelaea*, *Canis* cf. *etruscus, Canis arnensis apolloniensis, Alces latifrons, Ovis* sp. The material of Micromammalia, examined by Dr. V. Popov (pers. comm.) contains the following taxa: *Pliomys* sp., *Prolagurus* cf. *pannonicus, Allophaiomys pliocaenicus, Microtus hintoni* and *Hyppolagus brachignatus*, *Lepus* sp., Lagomorpha indet., Microtinae indet., Murinae indet.

Age: Micromammalian fauna biostratigraphically dates the locality to the Biharian, the middle of the *Microtus savini/ M. pusillus* biozone, chronostratigraphycally corresponding to the Early Pleistocene (Vaalian-Menapian), approximately 1,2-1,0 m.y.a. (V. Popov, pers. comm.). The occurrence of *Panthera spelaea* after Dr. Spassov probably suggests a contamination of the Early Pleistocene deposits with Middle Pleistocene ones.

Results and discussion

Taxonomic composition

The examined material represents a very small part (ca. 4,4 %) of the Pleistocene avian remains, collected so far from Bulgarian localities (BOEV, 1999, 2001). It also consists of 4,0 percent of the

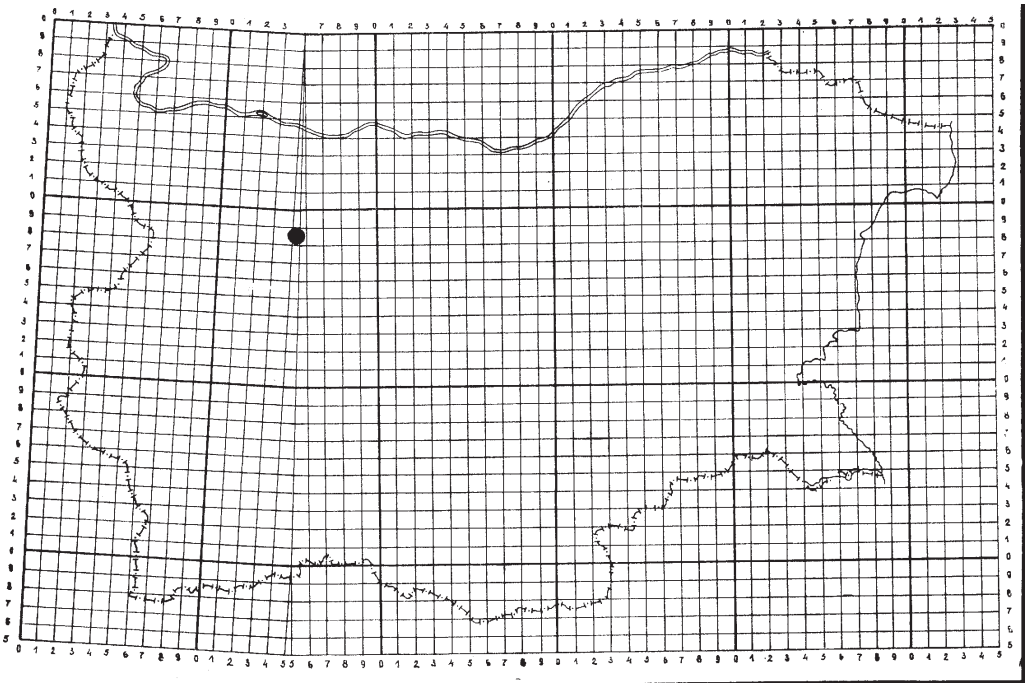

Fig. 3. Location of Kunino locality of Early Pleistocene vertebrate fauna.

taxonomic composition (Table 1) of the Pleistocene fossil record of the country (175 taxa, BOEV, 1999). It includes remains of three orders and six avian families: Falconidae, Tetraonidae, Phasianidae, Sylviidae, Corvidae, and Fringilidae.

Falconidae

Falco sp. ex gr. *cherrug*. The larger Palearcitc falcons are considered to be indicators of large rocky massifs used as nesting grounds. The specimen could not be further determined. *F. cherrug*, *F. peregrinus*, *F. biarmicus* and *F. eleonorae* occur at present in Bulgaria and all of them, except for the Eleonora's falcon, breed throughout the country (BOEV et al., in press, a).

Tetraonidae

Tetrao cf. *urogallus.* A small, but very diagnostic fragment of sternum (trabecula lateralis sterni) most probably suggests Capercaillie, rather than Black grouse. MOURER-CHAUVIRÉ (1976) considers the occurrence of the genus *Tetrao* as a firm indicator of the local cooling of the climate.

The species is very rare in the Pleistocene deposits in the French Alps (MOURER-CHAUVIRÉ, 1977). At the end of Würm the species' range confined to the Alps. In Bulgaria the present range includes five isolated parts in the high mountain regions of Rila, Vitosha, Rhodopes, Pirin, and the Western Balkan mountains between 1100 and 2200 m a. s. l. (BOEV, 1985; BOEV et al., in press, b).

Tetrao tetrix / Lagopus sp. The distal fragment of tbt is damaged and could not be determined further.

Phasianidae

Coturnix coturnix (Linnaeus, 1758). The Quail is the only European resident and migratory gallinaceous bird. Its range is limited northward by the 15° C July isotherm. It mainly inhabits open grassy lands in the plains and meadows (HARRISON, 1982). Avoids arid habitats and wetland. Usually prefers hilly treeless terrains up to 1000 m. a. s. l. (CRAMP & SIMMONS, 1980). In Bulgaria the species occurs up to 950 m a. s. l. (SIMEONOV & BOEV, 1988). It is believed that the wide range of the Quail is due to its expansion in the Quaternary (VOINSTVENSKIY, 1960). The finds of *C. coturnix* are very scanty in the Pleistocene record of Bulgaria (BOEV, 1999, 2001a).

Alectoris graeca (Meisner, 1804). Inhabits mountain and subalpine zones in the Mediterranean region up to 2300-2500 m a.s.l. in winter visits valleys and plains. Prefers dry rocky terrains with scattered trees and shrubs. Roams up to 10 km in searching of water sources (HARISON, 1982). Avoids large forrested areas. Often spreads above 900 m a.s.l. (CRAMP & SIMMONS, 1980). MOURIER-CHAUVIRÉ, (1976) considers its occurance in the Pleistocene deposits as an indicator fot climate warming.

Perdicinae indet. The size of the find suggests *Alectoris* spp. or *Perdix* spp. Besides incomplete determination of the find, remains of both genera have been uncovered in several Pleistocene localities throughout the country so far.

Sylviidae

Sylvia cf. *atricapilla*. The specimen represents a humeral half of a coracoid. It differs from *S. borin* in the wider acrocoracoidal part. It very much resembles *S. atricapilla*, but the find differs from it in the slightly less protuberant acocoracoidal part of the lateral side. The measurements (Fig. 4) are provided in Table 2. *Sylvia* cf. *atricapilla* is known from the Early Pleistocene of Austria and Spain. The species is also known from the Middle Pleistocene of France and Late Pleistocene of Czech Republic, France, Israel, Spain and Ukraine (TYRBERG, 1998). Thus, its occurrence in Bulgaria could not be considered unusual.

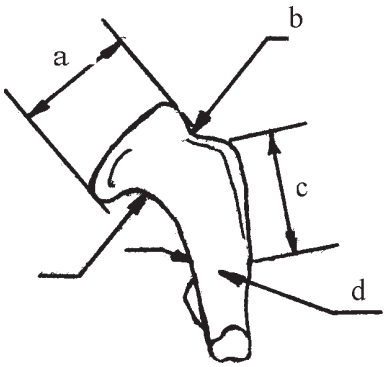

Fig. 4. Manner of measurements of coracoid of recent and fossil sylviids.

Table 2

The measurements of coracoid sin. dist. in some sylviids

Taxa	a	b	c	d
Fossil – Kunino				
Sylvia cf. *atricapilla* NMNHS 14 972	ca. 2,1	1,4	2,4	1,1
Recent				
Sylvia atricapilla BMNH 1996.50.5	2,2	1,4	2,2	1,0
Sylvia atricapilla BMNH 1996.34.1	2,4	1,5	2,6	1,1
Sylvia atricapilla BMNH 1989.24.1	2,3	1,7	2,6	1,2
Sylvia atricapilla BMNH 1994.4.1	2,2	1,8	2,4	1,2
Sylvia borin BMNH 1996.43.1	2,4	1,8	2,9	1,2
Sylvia mystacea BMNH 1998.13.8	2,0	1,3	1,9	1,0

Corvidae

Pyrrhocorax pyrrhocorax (Linnaeus, 1758). In the European Alpine zone of the temperate latitudes it is a resident species, inhabiting strictly rocky habitats up to the tree line (HARRISON, 1982). Most of its range lies between 1200 and 1500 m a. s. l. (CRAMP & PERRINS, 1994). A disappeared species of the recent avifauna of Bulgaria. Fossil records in the country: Late Pleistocene: Bacho Kiro Cave (BOCHEŃSKI, 1982) and Kozarnika Cave (BOEV, 2001b). The common chough is an indicator of the cool climate. Many of the Pleistocene sites of Europe lie out of the recent species' range (TYRBERG, 1991). MALEZ-BACIC (1979) determines *P. pyrrhocorax* as an index-fossil for the Late Pleistocene of Europe.

Fringillidae

Acanthis cf. *cannabina*. The Linnet is a resident and migratory species preferring open lands with scattered bushes, pastures, meadows, light riverine woods and forests edges (VOINSTVENSKIY, 1960; HARRISON, 1982).

Coccothraustes coccothraustes (Linnaeus, 1758). The Howfinch is a resident and migratory species spread in the Boreal and Temperate zones. Inhabits the broadleaf and mixed woods, but prefers woodlands near the rivers and lakes and forest-steppes in the plains and mountains (HARRISON, 1982). The range in summer is limited by the 17° C and 25° C July isotherms. It is considered the most specialized species to *Quercus-Carpinus* woods (CRAMP & PERRINS, 1994). The species is known from the Late Pleistocene deposits of the Razhishkata Cave (BOEV, 2000b), but the oldest records in the world of the genus *Coccothraustes* came from two other Late Pliocene localities of the NW Bulgaria, Varshets and Slivnitsa (BOEV, 1998).

Palaeoenvironmental implications

Tetrao, *Lagopus*, *Pyrrhocorax* and *Coccothraustes* in the Quaternary deposits of Europe are considered indicators of the cooling climate (MOURER-CHAUVIRÉ, 1975, 1993). On the other hand, *Coturnix* (the only European migratory gallinaceous), and partly *Alectoris*, exist in dry and moderate environmental conditions, indicating the presence of open land grassy habitats. This contradiction could only be explained with the presence of mosaic landscapes in the former vicinities of the site. The presence of the so-called "mixed" faunas was widely established in many Pleistocene localities in the Western and Central Europe (TYRBERG, 1998). In Bulgaria the best established example of the mixed avifaunas so far has been revealed in the Late Pleistocene deposits of the Kozarnika Cave (BOEV, 2001b), but Kunino also provides examples of that sort.

Acknowledgements

The Short-term Visits Program of the Royal Society (London), the NMNHS and Dipl. Eng. Georgi Hristov (an amateur-paleontologist from Pleven, North Bulgaria) have supported the study. The author is very grateful to Dr. Robert Prys-Jones and Dr. Joane Cooper (BMNH) for providing excellent working

conditions, which facilitated much of this study. He also thanks Ms. Vera Hristova, Dr. N. Spassov, Dr. Georgi Markov (NMNHS), Dr. Vasil Popov (Institute of Zoology, BAS), and Dr. Vet. Med. Nikolay Iliev for their help in the field work. Mr. G. Hristov submitted part of the personally collected fossil material to the NMNHS, which later contributed greatly to the general evaluation of the site.

References

BOCHEŃSKI Z. 1982. Aves. – In: Kozlowski J. (ed.). Excavations in the Bacho Kiro Cave (Bulgaria). Final report, Warszawa, Panstwowe Wydawnictwo Naukowe, 31-38.

BOEV Z. 1994. The Upper Pleistocene Birds. – In: J. Kozlowski J. K., Laville H. & Ginter B. (eds). Temnata Cave. Excavations in Karlukovo Karst Area, Bulgaria, Cracow, Jagellonian Univ. Press, **1** (2): 55-86.

BOEV Z. 1998. Late Pliocene Hawfinches (*Coccothraustes* Brisson, 1760) (Aves: Fringillidae) from Bulgaria. – Historia naturalis bulgarica, **9**: 87-99.

BOEV Z. 1999. Neogene and Quaternary birds (Aves) from Bulgaria. National Museum of Natural History, Sofia. 1-243 + 2 supplements (243 pp.: 251 tables, 291 charts, 36 maps, 7 schemes, 507 photographs).

BOEV Z. 2000a. Early Pleistocene and Early Holocene Avifauna of the Cherdzhenitsa Cave (Northwestern Bulgaria) – Historia naturalis bulgarica, **11**: 107-116.

BOEV Z. 2000b. Late Pleistocene Avifauna of the Razhishkata Cave (W Bulgaria). – Historia naturalis bulgarica, **12**: 71-87.

BOEV Z. 2001a. Birds over the mammoth's head in Bulgaria. – In: Cavaretta, G., Gioia, P., Mussi, M., Palombo M. R. The World of Elephants. Proceedings of the 1st International Congress. Roma, 16-20 Ottobre 2001, 180-186.

BOEV Z. 2001b. Late Pleistocene birds from the Kozarnika Cave (Montana District; NW 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, 113-128.

BOEV Z., MILCHEV B., POPOV V. (In press - a). The avifauna of Bulgaria and its exploration, formation and zoogeographical and ecological affinities. – In: Fet V., Popov A. (eds) Biogeography and ecology of Bulgaria. Kluwer Publishers, Leiden.

BOEV Z., GERASIMOV G., NIKOLOV S., KARAIVANOV N. (In press - b). Gluhar *Tetrao urogallus* Capercaillie. – In: Yankov P. (Ed.). Atlas of Breeding Birds in Bulgaria. Bulgarian Society for the Protection of Birds. Sofia.

CRAMP S., PERRINS S. M. (eds) 1994. Handbook of the Birds of Europe the Middle East and North Africa. The Birds of Western Palearctic, Vol. VIII. Crows to Finches. Oxford Univ. Press, 1-915.

CRAMP S., SIMMONS K. E. L. (eds) 1980. Handbook of the Birds of Europe the Middle East and North Africa. The Birds of Western Palearctic, Vol. II. Hawks to Bustards. Oxford Univ. Press, 1-695.

HARRISON C. J. O. 1982. An Atlas of the Birds of the Western Palearctic. Princeton Univ. Press, Princeton, New Jersey, 1-332.

MALEZ-BAČIČ V. 1979. Pleistocenska ornitofauna iz Sandalje u Istri te njezno stratigrafsko i paleoekološko značenje. – Paleont. Jugosl., **21**: 1-46.

MOURER-CHAUVIRÉ C. 1975. Les oiseaux du Pléistocène moyén et supérior de France. – Docum. Lab. Fac. Sci. Lyon, **64**: 1-624.

MOURER-CHAUVIRÉ C. 1976. Les oiseaux. – In: Lumley, H. (ed.). Les civilisations paléolithiques et mesolithiques de la France. Ed. du CNRS, Paris, 430-434.

MOURER-CHAUVIRÉ C. 1977. Les oiseaux de la fin des temps glaciaires en France. La disparition des espèces froides. – In: D. de Sonneville-Bordes (ed.). La fin des temps glaciaires en Europe. Talence, 24-28 mai 1977 Coll. intern. CNRS, **271**: 105-111.

MOURER-CHAUVIRÉ C. 1993. The Pleistocene avifaunas of Europe. – Archaeofauna, **2**: 53-66.

SIMEONOV S., BOEV Z. 1988. A study of the food spectrum of the Eagle owl (*Bubo bubo* /L./) in Bulgaria. – Ecologiya, **21**: 47-56 (In Bulgarian, English summary).

SIMEONOV S., MICHEV T., NANKINOV D. 1990. Fauna of Bulgaria. T. 20. Aves, Part I., Sofia, Bulg. Acad. of Sci. Publ. House, 1-350.

TYRBERG T. 1998. Pleistocene birds of the Palearctic: a catalogue. - Publ. of the Nuttall Ornithol. Club, No **27**, Cambridge, Massatchusetts: 1-720.

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: 16.02.2005

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

Ранноплейстоценска авифауна от Кунино (Северозападна България)

Златозар БОЕВ

(Р е з ю м е)

Находището представлява разкритие във варовиковата кариера над с. Кунино. Възрастта му е определена като ранен плейстоцен (ваал-менап, ок. 1,2-1,0 млн. *г.*). Материалът включва 36 костни останки от MNI 21 индивида, принадлежащи на 11 таксона от 3 разреда: Falconiformes: *Falco* sp. ex gr. *cherrug*, Falconiformes indet.; Galliformes: cf. *Tetrao urogallus*, *Tetrao tetrix/ Lagopus* sp., *Coturnix coturnix*, *Alectoris graeca*, Perdicinae gen., и Passeriformes: *Sylvia* cf. *atricapilla*, *Coccothraustes coccothraustes*, *Acanthis* cf. *cannabina* и *Pyrrhocorax pyrrhocorax*. Установяването както на студенолюбиви, така и на топлолюбиви авифаунистични елементи може да се обясни с наличието на мозаичен ландшафт в околностите на находището.