Early Pleistocene avifauna of Kunino (NW Bulgaria)

Zlatozar BOEV


Abstract. The Early Pleistocene (Vaalian-Menapiian, approximately 1,24,0 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. argollus, Tetrao tetrix/ Lagopus sp., Coturnix coturnix, Alectoris graeca, Perdicinae gen., and Passeriformes: Sylvia cf. atricapilla, Pyrrhocorax pyrrhocorax, Accipiter cf. cannabina and Crocorhinus cocrobrausta.

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 Ternata 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 terrestial 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.: NMNEIS 12210; 12298-12312; 12 54742 557; 14 970-14 978 (Table 1).

Abbreviations: cmc – carpometacarpus, dex. – dextra, dig. – digitum, dist. – distalis, later. – lateralis, prox. – proximalis, sin. – sinistra, tib – tibiotarsus.
### Table 1
Taxonomic list, collection numbers and MNI of the avian finds of the Early Pleistocene site near Kunino village

<table>
<thead>
<tr>
<th>No</th>
<th>Taxa</th>
<th>Collection numbers (NMNH) and skeletal elements</th>
<th>Number of finds</th>
<th>Minimum number of individuals (MNI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td><em>Falco</em> sp. ex gr. cherrug</td>
<td>ulna sin. prox. 12311</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Falconiformes indet.</td>
<td>phalanx dist. dig. pedis 14975</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><em>Tetrao cf. arrogalus</em></td>
<td>trabecula later. sterni 12312</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td><em>Tetrao tetrix / Lagopus sp.</em></td>
<td>tib. dex. dist. 12302</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td><em>Catus nivicola</em></td>
<td>humerus sin. dist. 12299, coracoid sin. dist. 14974</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>cf. <em>Catus nivicola</em></td>
<td>humerus dex. (diaphysal part, prox.) 14974</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td><em>Alectoris gavia</em></td>
<td>humerus dex. prox. 12309</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Pticinae gen.</td>
<td>humerus dex. 14 978</td>
<td>1</td>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><em>Syntis cf. atriapilla</em></td>
<td>coracoid sin. dist. 14972</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td><em>Caucaloxus caucaloxus</em></td>
<td>cnx sin. prox. 12210</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td><em>Acanthis cf. cannabina</em></td>
<td>coracoid sin. dist. 14971</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td><em>Pyrrhoaenex pyrrhoaenex</em></td>
<td>cnx dist. 12298, cnx sin. - digitus majus 12300</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Aves indet. (Non-Passeriformes)</td>
<td>humerus dex. (splinter) 12301, tib. prox. dex. 12303, tib prox. dex. 12304, scapula sin. (caudal part) 12305, scapula dext. (caudal part) 12306, tib. dex. prox. 12307, tib. sin. prox. 12308, vertebrae cervicis 12310, femur sin. (diaphysal part) 12 547, femur sin. 12 548, phalanx digit. pedis prox. 12 549, phalanx I digit. pedis 12 550, phalanx dist. dig. majus 12 551, phalanx digit. pedis 12 552, os pterygoideum 12 553, radius (diaphysal part) 12 554, os metacarpis majus sin. 12 555, femur dex. dist. 12 556, ulna sin. (medial part) 12 557, vertebrae cervicis - corpus 14970, tib. dex. (medial diaphysal fragment, diameter - 6,2 mm) 14973, humerus dex. dist. (splinter) 14976, humerus dex. dist. 14 977</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>37</strong></td>
</tr>
</tbody>
</table>
Short description of the site

The site represents an outcrop of a Sarmatian limestone massif (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.

Associated fauna: Our collected material contains remains of Tostudo sp., as well as numerous ones of Lepus sp., Eguus sp., Cervus sp., Sus sp., Lagormorpha, 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 spalae, Canis cf. conrus, Canis armenis apolloniensis, Ailes latifrons, Oris sp. The material of Micromammalia, examined by Dr. V. Popov (pers. comm.) contains the following taxa: Phiomys sp., Prolagurus cf. pannonicus, Allophaionyx pliocenicus, Microtus histoni and Hyoplagus brachignatus, Lepus sp., Lagamorpha indet., Microtinae indet., Murinae indet.

Age: Micromammalian fauna biostratigraphically dates the locality to the Biharian, the middle of the Microtus savini/ M. pusillus biozone, chronosтратigraphically corresponding to the Early Pleistocene (Vaalian-Menapian), approximately 1.2-1.0 m.y.a. (V. Popov, pers. comm.). The occurrence of Panthera spalae 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
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, Sylvidae, Corvidae, and Fringillidae.

**Falconidae**

*Falco* sp. ex *g. cherrug*. The larger Paleartic 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 (trabeacula lateralis sterni) most probably suggests Capercaillie, rather than Black grouse. MOURER-CHAUVIRE (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-CHAUVIRE, 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 tib 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 (VOINSTENSKIJ, 1960). The finds of *C. coturnix* are very scanty in the Pleistocene record of Bulgaria (BOEV, 1999, 2001a).


Perdicic in 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 coracid. 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 prominent acrocoracoidal 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 Czech Republic, France, Israel, Spain and Ukraine (TYRBERG, 1998). Thus, its occurrence in Bulgaria could not be considered unusual.

Table 2
The measurements of coracid sin. dist. in some sylviids

<table>
<thead>
<tr>
<th>Taxa</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sylvia cf. atricapilla</em> BMNH 1996.30.5</td>
<td>2,2</td>
<td>1,4</td>
<td>2,2</td>
<td>1,0</td>
</tr>
<tr>
<td><em>Sylvia atricapilla</em> BMNH 1996.34.1</td>
<td>2,4</td>
<td>1,5</td>
<td>2,6</td>
<td>1,1</td>
</tr>
<tr>
<td><em>Sylvia atricapilla</em> BMNH 1989.24.1</td>
<td>2,3</td>
<td>1,7</td>
<td>2,6</td>
<td>1,2</td>
</tr>
<tr>
<td><em>Sylvia atricapilla</em> BMNH 1994.4.1</td>
<td>2,2</td>
<td>1,8</td>
<td>2,4</td>
<td>1,2</td>
</tr>
<tr>
<td><em>Sylvia borin</em> BMNH 1996.43.1</td>
<td>2,4</td>
<td>1,8</td>
<td>2,9</td>
<td>1,2</td>
</tr>
<tr>
<td><em>Sylvia nisica</em> BMNH 1998.13.8</td>
<td>2,0</td>
<td>1,3</td>
<td>1,9</td>
<td>1,0</td>
</tr>
</tbody>
</table>

Fig. 4. Manner of measurements of coracid of recent and fossil sylviids.
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 (BOCHENSKI, 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-BASIC (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 cacciacauda* (Linnaeus, 1758). The Hoarfinch 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-stepps 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, Varskets and Silvnitsa (BOEV, 1998).

Palaeoenvironmental implications

*Tetrao, Lagopus, Pyrrhocorax and Coccothraustes* in the Quaternary deposits of Europe are considered indicators of the cooling climate (MOUSER-CHAUVIRE, 1975, 1993). On the other hand, *Coturnix* (the only European migratory gallinaceous), and partly *Mlectoris*, 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.

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References


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Раннеплейстоценска авифауна от Кунцино (Северозападна България)

Златоцар БОЕВ

(Р е з ю м е)

Нахождено предполага, разкритието във варовиковата карияета над с. Кунцино. Възрастта му с определена като ранен плейстоцен (вадманен, ок. 1,24,0 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., u Passeriformes: Sylvia cf. atricapilla, Coccothraustes coccothraustes, Acanthis cf. cannabina и Pyrrhocorax pyrrhocorax. Установяването както на спородобитниците, така и на икономически елементи може да се обясни с налицето на мозаичен ландшафт в околностите на находището.