

Pleistocene avifaunas of Bulgaria: a brief review¹

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Abstract. This paper sums up the faunistic results of the exploration of all Pleistocene bird faunas, uncovered so far in Bulgaria. They cover 160 species, 4 Early Pleistocene, 1 Middle Pleistocene, and 13 Late Pleistocene sites.

Key words: Paleozoology, Paleofaunas, Quaternary birds, Aves, Bulgaria

Introduction

As a country of southern geographical situation in Europe, Bulgaria has a great significance for the elucidation of the building of ranges and the former range fluctuations of the recent bird species in Europe. Bulgaria spans 111,000 km² and its territory could be divided in three main climatic regions: Temperate-continental (N and part of SW Bulgaria), Transitional (most of S and NE Bulgaria) and Continental-Mediterranean (the most S and the very E parts of the country) (VELEV, 1997).

The Pleistocene avifaunas of Bulgaria are still poorly known. In contrast to Croatia, partly Serbia and Greece and most of the countries of Central and Western Europe, the Pleistocene bird faunas of Bulgaria remained completely unstudied until the early 1980-ies. More considerable archaeological excavations of the Paleolithic sites have been carried out as early as the first decade of last century, but besides the regular mentioning of bird remains, they contained no taxonomical identifications.

The paleornithology is the youngest field of the ornithological science in Bulgaria. The first paper on fossil birds in Bulgaria was published in 1982 by the Polish paleornithologist Zygmunt Bocheński, who reports on 23 avian species (two of them, *Lagopus mutus* and *Pyrrhocorax pyrrhocorax* disappeared) from the Late Würmian (50 000-10 000 B.P.) deposits in the Bacho Kiro Cave (BOCHENSKI, 1982). It is the first research on the Pleistocene avifaunas of the country. The second paper, also by a foreigner, presents the results of the Georgian paleornithologist Prof. Dr. Nikolay Burchak-Abramovich (BURCHAK-ABRAMOVICH & NIKOLOV, 1984), describing two avian species from two Miocene localities of the country.

In 1997 a Czech paleornithologist published his notes on the Pleistocene findings in one of the caves in the Karlukovo Karst Area in NW Bulgaria (MLÍKOVSKÝ, 1997).

During the last two decades the author has published a series of studies. Most of the data came from cave deposits or rock fissures. According to the Bulgarian Speleological Federation at least 5000 caves have been registered throughout the country by 2001. Our data on Pleistocene avifaunas

¹ The paper follows the data of a report on the same topic, which was presented on 26 February, 2002 to the collegiums of the paleontology and zoology sections in the Paleontology Department, the Natural History Museum, London.

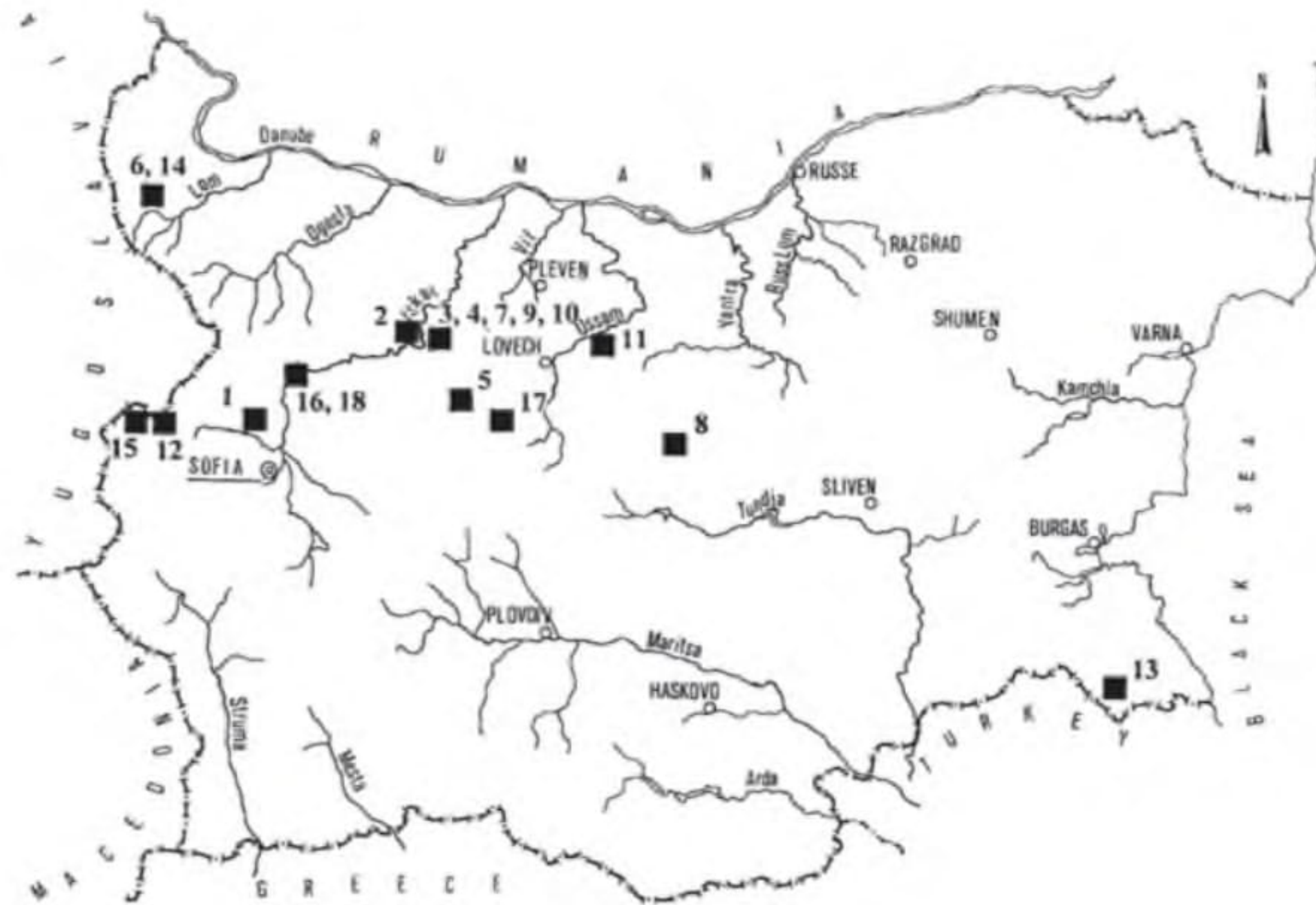


Fig. 1. Pleistocene avian localities in Bulgaria: 1 - Balsha quarry, 2 - Kunino quarry, 3 - Cherdzenitsa Cave, 4 - Temnata Douпка Cave, 5 - Morovitsa Cave, 6 - Kozarnika Cave, 7 - Cave No 16, 8 - Bacho Kiro Cave, 9 - Temnata Douпка Cave, 10 - Karlukovo 4 Cave, 11 - Devetashka Cave, 12 - Filipovska Cave, 13 - Mecha Douпка Cave, 14 - Mirizlivka Cave, 15 - Tsareva Tsarkva Cave, 16 - Kozarska Cave, 17 - Toplya Cave, 18 - Razhishka Cave.

concerns 18 caves, i.e. 0.4 %. The full taxonomic composition of the Bulgarian Pleistocene site has been reported by BOEV (1999, 2001).

The four Early Pleistocene localities are as follows: Temnata Douпка cave, Cherdzenitsa Cave, Kunino quarry and Balsha quarry. The Morovitsa Cave is the only Middle Pleistocene locality. Most of the localities (13) are of the Late Pleistocene. They are all caves: Kozarnika, Cave N 16, Bacho Kiro, Temnata Douпка, Karlukovo 4, Devetashkata, Filipovska, Mechata Douпка, Mirizlivka, Tsareva Tsarkva, Kozarskata, Toplya, and Razhishkata (Fig. 1).

Here we summarize all data on the Pleistocene bird faunas of Bulgaria, based on 5770 avian bone fossils (BOEV, 1999, 2001a). One site, the Temnata Douпка Cave, contains deposits both of the Early and the Late Pleistocene. The nesting habitat preferences of the recorded species show a forest-steppe landscape in the surroundings of the cave. The correlation between the woodland and the steppe (open land) species is 10:4, indicating the prevailing role of the forest habitats in this part of the country. The complete taxonomic list includes at least 160 recognized species.

The Balkan Peninsula as a refugium of the arboreal and termophylic avifauna

MOREAU (1954a) and BLONDEL (1984; 1987a,b) in their ornithogeographical analyses state that during the last glaciation (ca. 70 000 B.P.) the three Mediterranean peninsulas (Pyrenees,

Apennines and Balkans) played a key role in the survival of the wood avifaunistic complex. BLONDEL (1982) summarizes that the glacial events did not cause extinctions, or speciations in the Mediterranean region in the Pleistocene. On the contrary, because of the extraordinary topographic, edaphic and climatic heterogeneity and the high diversity derived from it, a process of intensive speciation in the Pyrenees, Apennines and Balkans occurred during the Pleistocene, but this speciation concerns only a very limited part of the arboreal avifauna of the region (BLONDEL, 1984; 1985; 1987b).

The southern parts of the Balkan Peninsula, as well as the other two larger peninsulas of Europe sheltered suitable refugia for the heat-loving fauna in the colder stages during the Middle and the Late Pleistocene. The occurrence of *Testudo* sp. in the Early Pleistocene site near Kunino, (possibly) confirms such a statement. *Testudo hermanni* is known from Würm-2 in France too (BLONDEL, 1985).

As it is known, the glacial events on the Balkans were considerably poorer, especially in the southern parts of the peninsula. The main part of the populations of *Turdus* spp., *Sitta* spp., *Picus* spp., *Picoides* spp., *Certhia* spp., *Prunella* spp., *Alectoris* spp., *Garrulus glandarius*, *Hieraeetus fasciatus*, *Falco eleonora*, etc. have survived namely in these regions (BLONDEL, 1985). The representatives of most of these genera have been established in the Pleistocene deposits of the cited localities of Bulgaria also (BOEV, 2001). They were usually found in several localities. Thus, for the first time the fossil record of Bulgaria has confirmed the regularities, mentioned above.

According to BLONDEL (1984; 1987a) the evolution of four genera (*Alectoris*, *Sitta*, *Sylvia* and *Monticola*) of the Palearctic fauna occurred predominantly in the Mediterranean. The Balkans and the West Asia Minor form the second (after the Pyrenees-Apennines) center of speciation in warblers of the genus *Sylvia* during the Pleistocene. At present this eastern center is inhabited by 11 species. Blondel calls it "eastern center of endemism and dispersion of the "melanocephala" group" in contrast to the "western center of "undata". *Sylvia communis* has been established in Devetashkata Cave, while the remains of *S. cf. atricapilla* occurred in the Cherdzenitsa Cave - 1. These finds mark the genus's distribution during the Pleistocene in Bulgaria: the former one from the Middle Pleistocene and the latter from the Late Pleistocene.

As BLONDEL (1987b) summarizes, the oldest record of *Alectoris*, *Sitta* and *Sylvia* comes from the Mediterranean and dates back to the Middle to Late Pleistocene. Here the record of the Late Pliocene *Sitta* sp. n. from W Bulgaria, the oldest record of this genus in the world, deserves special attention, but the Late Pliocene and all the Tertiary avian records are beyond the scope of the present report.

The fossil record of Bulgaria shows that in the Pleistocene at least 50 recent avian genera were spread: *Accipiter*, *Falco*, *Buteo*, *Aquila*, *Aegypius*, *Circus*, *Falco*, *Alectoris*, *Perdix*, *Coturnix*, *Phasianus*, *Lagopus*, *Tetrao* (incl. *Lyrurus*), *Crex*, *Porzana*, *Rallus*, *Gallinula*, *Otis*, *Columba*, *Streptopelia*, *Otus*, *Bubo*, *Nyctea*, *Strix*, *Apus*, *Dendrocopus*, *Lullula*, *Alauda*, *Riparia*, *Ptyonoprogne*, *Anthus*, *Lanius*, *Oenanthe*, *Turdus*, *Monticola*, *Erithacus*, *Cettia*, *Sitta*, *Bombycilla*, *Fringilla*, *Loxia*, *Carduelis*, *Pyrrhula*, *Passer*, *Sturnus*, *Garrulus*, *Pica*, *Nucifraga*, *Pyrrhocorax*, *Corvus*, etc. Most of them could be unquestionably referred to the group of the dendrophylous, or arboreal birds. A smaller part (*Alectoris*, *Apus*, *Riparia*, etc.) are obligatory termophylous, chiefly petrophylous elements.

The representatives of the arboreal avifauna have been localized in the glacials south of the Balkan Range, where besides coniferous, there were vast deciduous forests in the southern parts. It is believed that in Bulgaria the most important were the broad-leaved forests in the SE parts of the country (Strandza and Sakar mountains). These regions as a whole, are determined by MOREAU (1954a,b) as refugia for the survival of Honey Buzzard, Tawny Owl, Middle Spotted Woodpecker,

Green Woodpecker, Golden Oriole, Nuthatch, Icterine Warbler, Blackcap, Whitethroat, Wood Warbler, Red-breasted Flycatcher, Hawfinch, etc.

Tetraonids are determined as a specific element of the Pleistocene avifaunas of Europe by MOURER-CHAUVIRÉ (1993). This regularity is present in the Pleistocene localities in the Balkans too. All the five tetraonids spread in Europe were widely spread during the Pleistocene in Bulgaria too.

The steppe landscapes prevailed in N Bulgaria in the Pleistocene. In the steppes of W Europe (France, Spain) by the Middle and the early Late Pleistocene *Perdix palaeoperdix*, the ancestor of the modern gray partridge was widely spread (MOURER-CHAUVIRÉ, 1993; SANCHÉZ, 1996b). This species was established for the first time on the Balkan Peninsula in four Bulgarian caves - Kozarnika, Cave No 16, Devetashka and Razhishka.

The following bird species of the thermophilic fauna have been established in Bulgaria: Honey Buzzard, Swift, Alpine Swift, Nightjar, Bee-eater, Sand Martin, Northern Wheatear (entomophagous), Quail, Corncrake, Baillon's Crake, Turtle Dove (phytophagous), Short-toed Eagle (herpetophagous), etc. All of them are now represented in Bulgaria and the Balkans by their breeding populations. Some heat-loving species of Micromammalia (*Apodemus mystacinus*, *Jordanomys major*) have been recorded even in the Pleistocene localities of N Bulgaria (POPOV & DELCHEV, 1997). The range of *A. mystacinus* at present is confined to the E Mediterranean.

It is usually believed that the recent avifauna of the Temperate zone of the Palearctic is a result of the Holocene migration of the faunistic complexes. For the bird fauna of the neighboring Romania for example, DRUGESCU (1987) states that its genesis is due to the migration of the elements of the Mediterranean, Caucasian, Syrian, Indian and Mongolian refugia after the end of Pleistocene.

Our data for Bulgaria, at least for S Bulgaria, do not support this hypothesis. The Early Holocene faunal changes were actually the last considerable events, which led to the modern state of the recent Balkan avifauna. But it should be evaluated in reference to the faunistic complexes of the terrestrial fauna of the vertebrates that had been formed earlier, i. e. in the Pleistocene. As a whole, the avifauna of Bulgaria had almost a modern definite character.

Seasonal migrants in the Pleistocene localities

Now it is well known that most of the modern species of birds appeared in the Late Pliocene and the Pleistocene. Many relict routes of migrations have survived until the present, as stated by KUMARI (1959). Hence, the seasonal migrations of birds are a paleogeographic heritage.

On the other hand, migrations as an adaptation of birds to evade the unfavorable environmental conditions are very dynamic and "plastic". Many examples refute the hypothesis of their conservativeness. Data of modern ornithology on the neo-migrations show that the routs and the winter areas (winter ranges) could be considerably changed in very short terms.

One of the most evident proofs of the completely changed migration is the Red-breasted Goose. In two decades only (1960-1980) this species has drastically changed its winter range from the Kazil-Agach steppe along the Caspian Sea coast in Azerbaijan with arable lands in South Dobrudzha (the Shabla-Ezerets Lake complex) along the Black Sea coast in Bulgaria. Almost the whole winter range has moved here and during the last several years almost the whole species' population of this Siberian species (56 000 birds) spent the winter in the NE of Bulgaria (GEORGIEV, 1995).

VILETTE (1983) divides the European species according to their breeding migratory populations into two main types: migrants breeding in the northern latitudes, and migrants breeding in the

temperate latitudes. As we know, during the Pleistocene, only a small limited part of the S European territory preserved suitable habitats for wintering of the European migratory populations. As MOREAU (1954a,b) states, relatively warmer open grounds that are now common in many regions of the Mediterranean peninsulas, were absent in the cold phases of the Pleistocene. This reflected the duration, distance and direction of the migrations. Most of the populations made trans-Mediterranean migrations to N Africa or SW Asia. The water birds, however, were not forced to leave their shelters in the S-European limits along the coasts of the Tyrrhenian, Adriatic, Aegean, Black, Asov and Caspian seas, where they had suitable wintering grounds.

We have established the occurrence of some aquatic species of a more “northern” for the region distribution in the Early to Late Holocene too. Some of the localities of the S Black Sea Coast and of N Bulgaria: *Oxyura leucocephala*, *Aythya nyroca*, *A. ferina*, *A. fuligula*, and *Phalacrocorax aristotelis* (BOEV, 1995; unpubl. data). Most of them are now only winter visitors of the country.

Some migrants that now visit the country only in the winter season have been established by their numerous fossil (and subfossil) remains. These species are: *Gavia arctica*, *G. immer*, *G. stellata*, *Anser fabalis*, *A. albifrons*, *A. erythropus*, *Anas penelope*, *A. crecca*, *Bucephala clangula*, *Melanitta nigra*, *Buteo lagopus*, *Circus cyaneus*, *Cygnus olor*, *Tringa nebularia*, *Tr. glareola*, etc. During the Middle and Late Pleistocene they were visiting the country, but we do not know their status of sojourn. Their breeding range now lie further N of the territory of Bulgaria.



Fig. 2. Present day range of *Lagopus mutus* (dotted) in Europe (after JONSSON, 1994) and the location of the Pleistocene sites of the species in Bulgaria: 1 - Bacho Kiro Cave (after BOCHENSKI, 1982), 2 - Devetashka Cave (incl. finds of *L. mutus/lagopus*).



Fig. 3. Present day range of *Lagopus lagopus* (dotted) in Europe (after JONSSON, 1994) and the location of the Pleistocene sites of the species in Bulgaria: 1 - Devetashka Cave, 2 - Kozarnika cave, 3 - Filipovska cave.

Boreal elements in the Pleistocene avifaunas

Now for the first time the whole “boreo-mountain”, “glacial”, “alpine”, “Pleistocene” avifaunistical complex, characteristic for the glacial stages of the Pleistocene in the Temperate Zone of Europe, has been established in Bulgaria too. At present the arcto-alpine fauna has a very limited distribution in Bulgaria.

Our data show that the avian boreal complex numbers at least 15 woodland, steppe and hydrophilous species. These species are: Willow Grouse (Fig. 2), Ptarmigan (Fig. 3), Snowy Owl, Short-eared Owl, Pygmy Owl, Tengmalm’s Owl, Great Grey Owl (identified as *Strix* aff. *nebulosa*), Rough-legged Buzzard, Whimbrel or Slender-billed Curlew (*Numenius phaeopus/tenuirostris*), Red-breasted Goose, Goldeneye, Common Scotter, Shore Lark, Chough and Alpine Chough. This list completes the information available so far from some other Balkan countries (mainly Croatia, Slovenia, Serbia and Romania).

The boreal avifauna is best established in the Late Pleistocene deposits of the Devetashkata Cave in the Central Stara Planina Mountain (Central part of the Balkan Range). Some specific faunistic elements have been established also in other caves. The presence of the Snowy Owl for example has been proved in the Kozarnika Cave in the Western Stara Planina Mountain (BOEV, 1998b). All these records also confirm for the first time in Bulgaria the southward extension of the ranges of boreal elements during the cold phases of the Pleistocene.

“Mixed” avifaunas

According to NAZARENKO (1990) a large meridional “forest” bridge between the southern, temperate and northern regions had a key role in the interchange of the terrestrial faunas in the Palearctic during the last 35 000 years. It was used by the woodland birds for the extension of their ranges from South to North in the Eastern Palearctic. It is very likely that the mountain chains of the Apennines and the Balkans in the southern parts of the Western Palearctic had a similar role. That is why, because of the high diversity of the relief and the mosaic character of the landscape, in the neighboring parts of a territory birds so different in type such as the thermophilic “Mediterranean” *Sylvia atricapilla*, and the cold-loving “boreal” *Aegolius funereus* occurred together. The occurrence of *S. atricapilla* during the Early Pleistocene in the Cherdzenitsa Cave was proven, while *S. communis* was spread in the vicinity of the Devetashkata Cave in the Late Pleistocene. In addition, a find of *Sylvia* sp. has been established in the Razhishkata Cave dating back to the Late Pleistocene too (BOEV, 2000).

S. atricapilla coexisted in the Early Pleistocene with *Dendrocopos minor* and *Pyrrhula pyrrhula*, while in the Late Pleistocene *S. communis* coexisted with *Tetrao tetrix*, *Lagopus lagopus*, *Tetrastes bonasia*, *Glaucidium passerinum* and *Aegolius funereus*. Such “mixed” avifaunas were discovered in the Pleistocene

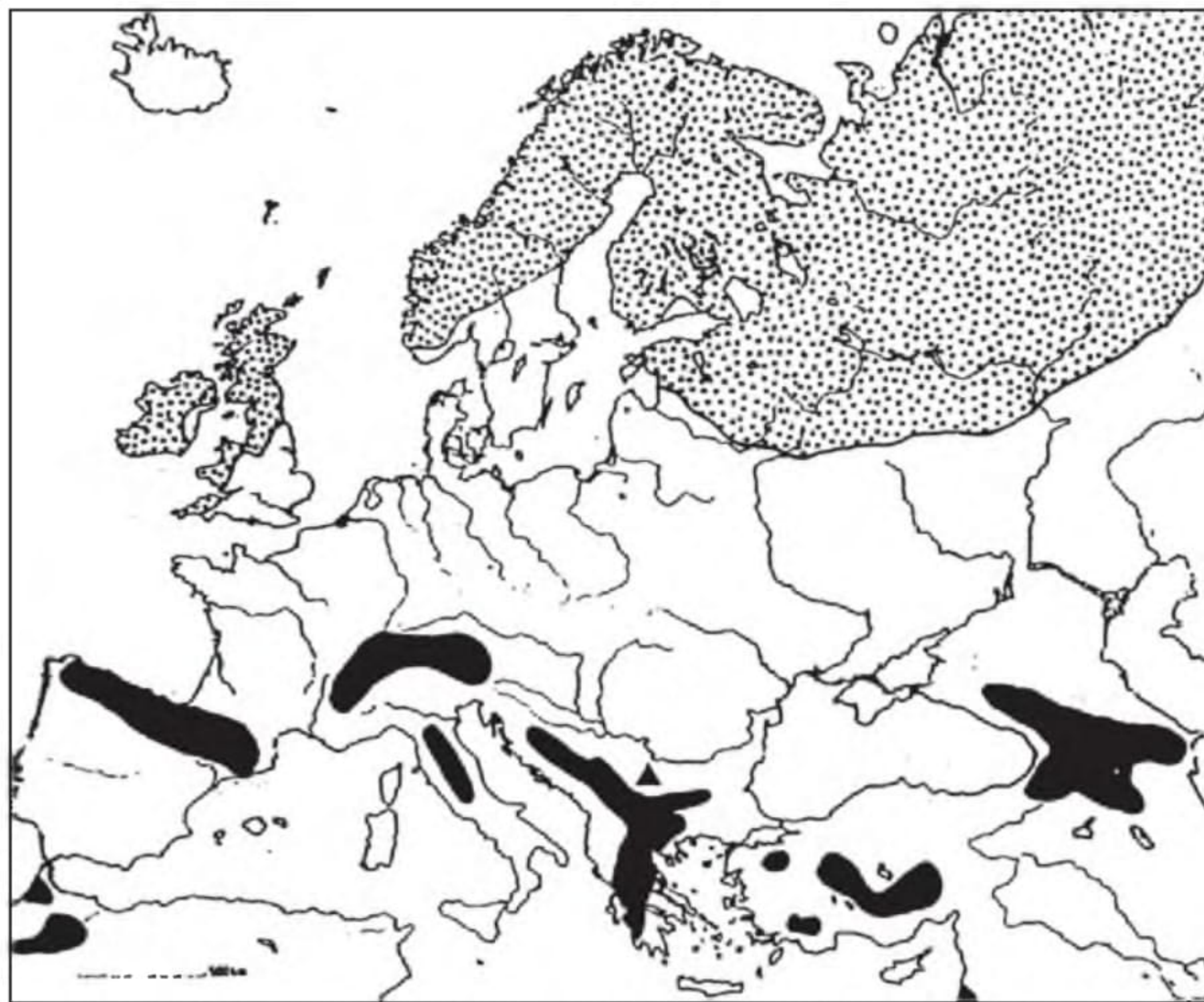


Fig. 4. Present day range of *Lagopus lagopus* (dotted) and *Pyrrhocorax graculus* (black) in Europe (after JONSSON, 1994) and the location of the Kozarnika cave (triangle), where both species coexisted in the Late Pleistocene.

for different parts of the Palearctic: Transcaucasia (*Gallus gallus* and *Lagopus lagopus*) of the Paleolithic in Georgia (BURCHAK-ABRAMOVICH, 1986), western Mediterranean (*Lagopus* sp. and *Gyps fulvus*, *Tetrao tetrix* and *Alectoris* sp.) of Würm 2 in Monaco (MOURER-CHAUVIRÉ, 1975a), *Falco naumanni* and *Lagopus mutus* and *Monticola saxatilis* and *Nyctea scandiaca*) of Riss in S France, etc. Similar are the associations of “*Nyctea scandiaca* - *Pyrrhocorax graculus*” from the Kozarnika Cave in W Bulgaria (Late Pleistocene; BOEV, 2001b) and “*Nyctea scandiaca* - *Cervus dama*” in the Middle Pleistocene in Italy (BARBATO et al., 1992).

“Mixed” Pleistocene faunas are known also from Middle Europe. Some boreal forms as *Tetrao conjugens*, *T. macropus* and *Lagopus atavus* coexisted with the Mediterranean *Francolinus capeki* and *Fr. minor* (JANOSSY, unpubl. data; BOCHENSKI, 1985) in the Plio-Pleistocene of Hungary. Similar coexistence is known from the Late Pleistocene in Poland, where BOCHENSKI (1974) established the boreal *Falco columbarius*, *Eudromias morinellus* and *Numenius phaeopus* and the Mediterranean *Aegypius monachus* and *Apus melba*. The summarized data of TYRBERG (1991a) show that in the 850 Würmian localities of W and C Europe *L. lagopus* and *L. mutus* coexisted with *C coturnix* and *T. tetrix*. He proved that very often some arcto-alpine forms such as *Aquila chrysaetos*, *Falco tinnunculus*, *Nyctea scandiaca*, *Alauda arvensis*, *Corvus corax*, *P. pyrrhocorax* and *P. graculus* coexisted with steppe and Mediterranean ones such as *Buteo rufinus*, *Circus macrourus*, *Falco vespertinus*, *Alectoris* spp., *Melanocorypha* spp. *Calandrella* spp. and *Sturnus roseus*). BARBATO et al. (1992) reported on common occurrence of

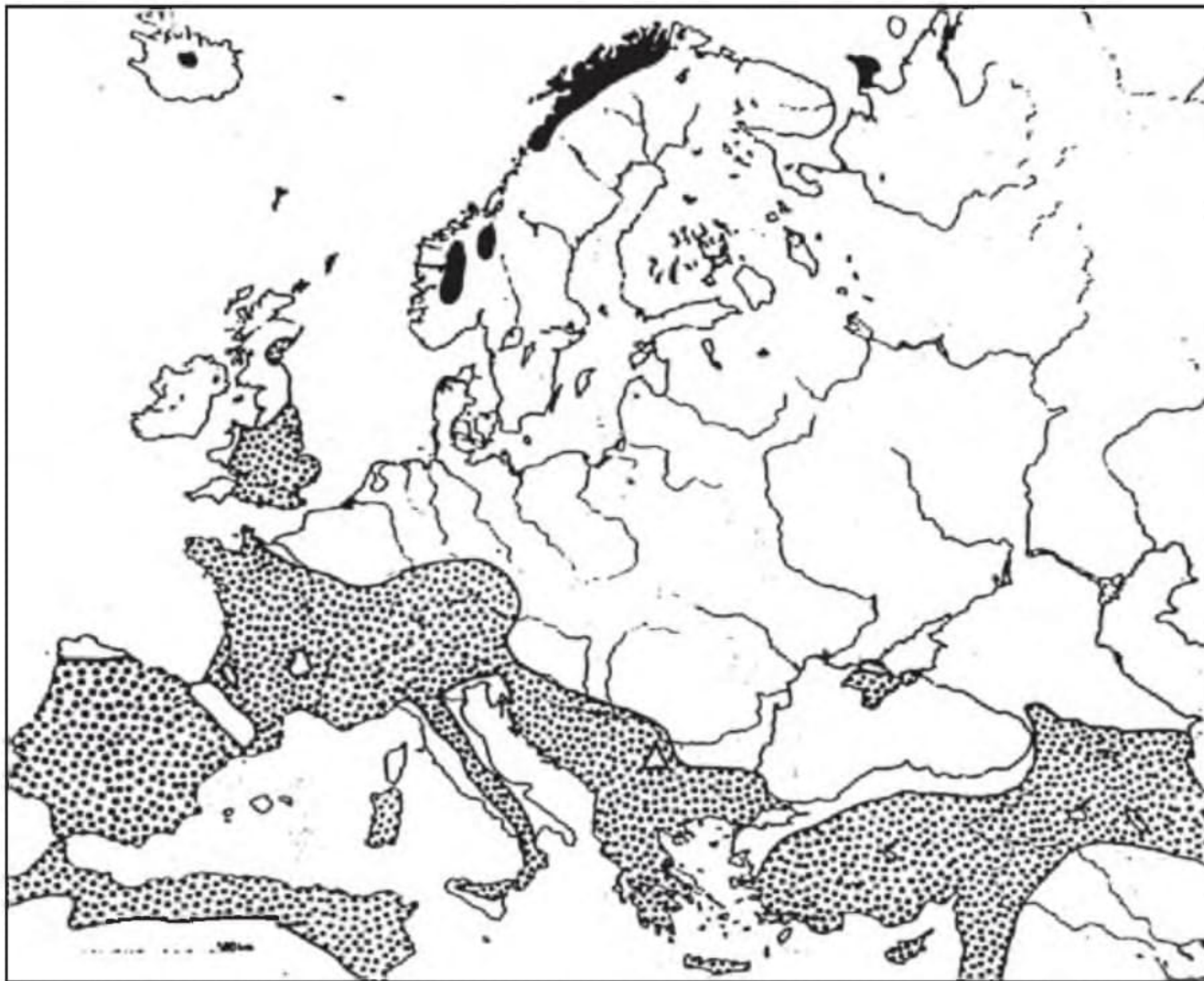


Fig. 5. Present day range of the genus *Nyctea* (black) and the genus *Alectoris* (dotted) in Europe (after JONSSON, 1994) and the location of the Kozarnika Cave (triangle), where species of both genera coexisted in the Late Pleistocene.

Alectoris graeca and *Nyctea scandiaca* and of *Pyrrhonorax graculus* and *Perdix perdix*. This overlapping of the ranges of the “northern” and “southern” forms is one of the most specific features of the Pleistocene avifaunas of Europe. *P. graculus* and *L. lagopus* also coexisted during the Late Pleistocene in Bulgaria (Fig. 4).

Almost all the rest of the records of the Snowy Owl and Rock Partridges are among the best examples of the “mixed” avifaunas. This association is also established in Bulgaria (the Kozarnika Cave and the Devetashkata Cave; BOEV, 1998a,b; 2001b; Fig. 5). A similar example from the Kozarnika Cave is the coexistence of the Willow Grouse and the Red-rumped Martin.

The summarizing data for Europe of BOCHENSKI (1985) outline the Würmian coexistence of *L. lagopus* and *Surnia ulula* and *Melanocorypha calandra* and *Pyrrhonorax graculus* on the other hand. Such an association (*Melanocorypha* sp. - *Pyrrhonorax pyrrhonorax*/*P. graculus*) we have established for the first time in Bulgaria in the Razhishkata Cave (BOEV, 1998a,b; 2000). Other examples of the “mixed” avifaunas are also known from Bulgaria. BOCHENSKI (1982) reports on remains of *Lagopus mutus* and *Alectoris graeca* in the Bacho Kiro Cave that have coexisted. Our data (BOEV, 1994) proved that in the surroundings of the Temnata Douпка Cave ca. 28 900 B. C. some Mediterranean (*A. monachus* and *Al. graeca*) and some boreo-mountain (*N. caryocatactes*) species also coexisted. In the Kozarnika Cave the Chough coexisted with the Willow Grouse (BOEV, 2001b).

There are also a number of other examples from Bulgaria. According to BLONDEL (1985) this combination of birds of different biotas could be explained by the uniqueness of the physico-geographical characteristics of the N Mediterranean being a kaleidoscope of landscapes.

Thus, during all phases of the Pleistocene, due to the topographic diversification of the region, various species of the humid (i. e. mesophilous) forests, as well as the inhabitants of the drier xerophitic cold steppes coexisted in the mosaic landscapes of the Mediterranean. As a whole, the “mixed” avifaunas in Europe had survived until ca. 50 000 B.P., when the distribution of birds acquired its modern aspect. “Mixed” faunas in mammals are much better known from most of the Pleistocene localities. According to POPOV (1990a,b) the Late Pleistocene fossil assemblages from the Temnata Douпка Cave contained European-West-Siberian (wood and forest-steppe) and East-European-Kazakhstan (arid) elements. These “mixed” assemblages consisted of species that at present never occur together and POPOV (1990a,b) concludes that they are younger and more dynamic formations - a result of the local peculiarities of the fauna development.

All these data on the Pleistocene record of birds from Bulgaria allow to draw the following:

Conclusions

The avian Pleistocene record of Bulgaria is still poorly known although it includes 160 species of 13 orders - 40.0 % of the recent country's bird fauna. Most of the material originates from Würmian (Late Würmian) deposits, making two thirds of the Pleistocene sites.

The Pleistocene avifauna of Bulgaria contained 8 species that disappeared from the recent country's fauna: *Lagopus mutus*, *Lagopus lagopus*, *Tetrao tetrix*, *Phasianus colchicus* (native subspecies *colchicus* form), *Glaucidium passerinum*, *Nyctea scandiaca*, *Strix* aff. *nebulosa* and *Pyrrhonorax pyrrhonorax*. In addition another 4 species established in the Pleistocene deposits (Black Vulture, Snipe, Great Bustard and Little Bustards) disappeared from the Late Holocene breeding bird fauna of the country.

The Late Pleistocene avifaunas included fossil taxa - one fossil species (*Perdix palaeoperdix*) and one fossil subspecies (*Pyrrhonorax graculus vetus*). The Late Pleistocene localities of *Perdix palaeoperdix*

probably prove its (?) coexistence with the modern Grey Partridge (*Perdix perdix*). They are the youngest records of that extinct species so far.

The Early Pleistocene avifaunas of Bulgaria are known from 4 localities with 26 taxa of 5 orders. The most numerous are the Passeriformes. One species (the Chough) has disappeared. The Cherdzenitsa Cave is the fourth Early Pleistocene locality of that species in the Palearctic (TYRBERG, 1998). The records of the Lesser Spotted Woodpecker, Red-rumped Swallow, Sand Martin, Rock Thrush and the House Sparrow are the oldest ones, while the finds of the Woodlark are the second known from the Early Pleistocene in the Palearctic.

The Middle Pleistocene avifaunas are least known among the Pleistocene faunas of Bulgaria. Only 1 site with 7 taxa of 2 orders has been established so far.

The Late Pleistocene avifaunas are studied best. They are known from 13 sites with 134 taxa of 13 orders.

In the interglacials some Mediterranean species (Alpine Swift, Red-rumped Swallow) extended their ranges northwards in the Late Pleistocene, reaching the northern parts of the country.

The Pleistocene avifaunas of Bulgaria developed in close connection with the remaining bird faunas of the neighbour regions of SE Europe. For some groups they show a wider distribution of some recent species. The country's Pleistocene (at least Würmian) avifauna showed the whole boreo-mountain complex, consisting of 15 species at least, specific for the Temperate Zone of Europe in the Middle and Late Pleistocene.

The Colchic Pheasant in Bulgaria is a species of autochthonous origin, recorded from 3 Late Pleistocene sites. *Phasianus colchicus* (native subspecies *colchicus*) disappeared from the recent bird fauna of the country and the whole of Europe. On the other hand the Black Grouse was actually spread, even widely spread, throughout the whole country. Its remains were found in 7 Middle and Late Pleistocene localities and they sufficiently document its distribution during the last 80 000 years.

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Плейстоценските орнитофауни в България – кратък преглед

Златозар БОЕВ

(Резюме)

Обобщени са фаунистичните резултати от проучването на плейстоценските находища на птичи останки, известни досега в България. Те обхващат 160 вида, 4 ранноплейстоценски, 1 средноплейстоценско и 13 късноплейстоценски находища. Въпреки това, все още плейстоценската авифауна на България е слабо проучена. От почти 5000 пещери и над 400 рецентни вида птици досега са проучени под 0,4 % от пещерите и са установени 40,0 % от състава на птиците. Най-многобройни са материалите с вюрмска възраст, съставляващи 2/3 от всички плейстоценски находки.

Плейстоценската авифауна включвала 8 изчезнали от съвременната фауна на страната видове – *Lagopus mutus*, *Lagopus lagopus*, *Tetrao tetrix*, *Phasianus colchicus colchicus*, *Glaucidium passerinum*, *Nyctea scandiaca*, ?*Strix* aff. *nebulosa* и *Pyrhacorax pyrhacorax*. Освен тях, 4 други вида (*Aegypius monachus*, *Gallinago gallinago*, *Otis tarda* и *Tetrax tetrax*) са изчезнали в късния холоцен (20 век) като гнездещи птици в страната.

Късноплейстоценската орнитофауна включвала 2 фосилни таксона – полската пряребица (*Perdix palaeoperdix*) и дребната жълтоклонна гарга (*Pyrhacorax graculus vetus*). Плейстоценските находища на *Perdix palaeoperdix* вероятно доказват съвместното съществуване на вида с полската яребица (*Perdix perdix*). Те са най-младите досега известни находки на този вид.

Ранноплейстоценските авифауни са известни от 4 находища с 26 таксона и 5 разреда, най-многобройни от които са Passeriformes. Един вид от тях (*Pyrhacorax pyrhacorax*) е изчезнал от страната. Пещерата Чердженица е 4-то ранноплейстоценско находище на червеноклонната хайдушка гарга в Палеарктика. Находките на *Dendrocopos minor*, *Hirundo daurica*, *Riparia riparia*, *Monticola saxatilis* и *Passer domesticus* са най-древните находки в Палеарктика, а находката на *Lullula arborea* е втора за ранния плейстоцен в Палеарктика.

Средноплейстоценските авифауни са най-слабо проучени. За тях свидетелства има само от 1 находище със 7 таксона и 2 разреда.

Късноплейстоценските птици засега са изследвани най-пълно. Техни останки са намерени в 13 находища със 134 таксона от 13 разреда. През интергласиалите някои видове с медитеранско разпространение като *Apus melba* и *Hirundo daurica* са разширявали ареалите си на север, достигайки дори до северните части на страната.

Плейстоценските авифауни в България се развивали в непосредствена връзка с фауните на съседните райони в Югоизточна Европа. За някои групи птици те показват по-широки ареали от съвременните. Плейстоценската (главно вюрмска) орнитофауна на страната включвала целият борео-монтанен комплекс от над 15 вида, специфични за умерения пояс в Европа през средния и късния плейстоцен.

Phasianus colchicus colchicus е с автохтонен произход, доказан от находките му в три късно-плейстоценски находища. *Tetrao tetrix* действително е бил разпространен широко из цялата страна. Останките му са намерени в 7 средно- и късноплейстоценски находища, документирайки по такъв начин непрекъснатото му разпространение в България през последните 80 000 г.