

**PALEOORNITHOLOGICAL REMAINS FROM
SOME OF THE CAVES IN SLOVENIA**

**PALEOORNITOLOŠKI OSTANKI IZ
NEKATERIH JAM V SLOVENIJI**

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Izvleček

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Vesna Malez: Paleornitološki ostanki iz nekaterih jam v Sloveniji

Članek podaja rezultate novih paleornitoloških raziskav iz petih slovenskih jam (Babja jama, Ciganska jama, Jama pod Herkovimi pečmi, Lukenjska jama, Županov spodmol). Določenih je bilo 8 družin, 13 rodov in 14 vrst (med temi jih je 5 pokazatelj hladnejše klime). Lovski plen pripada družinam *Anatidae*, *Tetraonidae* in *Otididae*.

Ključne besede: paleontologija, *Aves*, paleolitik, Slovenija

Abstract

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Results of paleornithological investigations from five caves of Slovenia (Babja jama, Ciganska jama, Jama pod Herkovimi pečmi, Lukenjska jama, Županov spodmol) are given in the paper. 8 families, 13 genera and 14 species were determined. Five of them are indicators of colder climate. The hunting birds belong to families *Anatidae*, *Tetraonidae* and *Otididae*.

Key words: paleontology, cave fauna, *Aves*, palaeolithic, Slovenia

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Slovenia is rich in cave localities in which the Pleistocene and Holocene deposits have been researched. Abundant osteological material has been collected and numerous animal assemblages have been determined, as well as several avifaunal species. Up to now some of the avifaunal material has been taxonomically determined from the Paleolithic localities: Betalov spodmol near Postojna (Rakovec, 1959) - 6 species; Potočka zijalka on Olševa (Brodar & Brodar, 1983) - 1 species; Roška špilja near Divača (Škocjan) - 10 species; and Divje babe I in the Idrija valley - 8 species. From the Neolithic locality Ajdovska jama near Nemška vas (Krško area) - 5 bird species have been determined (Malez, in press).

Previous determinations of the Pleistocene ornithological material show that 21 bird species inhabited the mentioned caves. Now, five more sites join the Paleolithic localities with their avifaunal osteological material and new bird species (Table I.).

In Babja jama near Dob, in the neighbourhood of Domžale, beside numerous animal bones (Pohar, 1985) some avifaunal material has been collected. Skeletal bird remains belong to the whooper swan (*Cygnus cygnus*), willow grouse (*Lagopus lagopus*) and blackbird (*Turdus merula*).

From the Ciganska jama near Željne (Kočevje) two species of the same genus have been determined, which belong to the family Tetraonidae, and they are willow grouse and ptarmigan (*Lagopus lagopus* and *Lagopus mutus*) (Pohar, 1992).

All ornithological remains from the Jama pod Herkovimi pečmi near Radlje ob Dravi (Pohar, 1981) belong to the family Tetraonidae, and they are willow grouse (*Lagopus lagopus*), ptarmigan (*Lagopus mutus*), capercaillie (*Tetrao urogallus*) and black grouse (*Lyrurus tetrix*).

Six bird bones from the Lukenjska jama near Novo mesto (Pohar, 1983) belong to different families: Anatidae - mallard (*Anas platyrhynchos*), Accipitridae - golden eagle (*Aquila chrysaetos*), Falconidae - hobby (*Falco subbuteo*), Tetraonidae - willow grouse (*Lagopus lagopus*), Laniidae - great grey shrike (*Lanius excubitor*) and Corvidae - raven (*Corvus corax*).

Somewhat more abundant bird skeletal remains (12 bones) were excavated from the C and D layers of the Paleolithic locality Županov spodmol near Sajeveče (Postojna) (Brodar & Osole, 1979). The ornithological remains are represented by five species: ptarmigan (*Lagopus mutus*), black grouse (*Lyrurus tetrix*), common partridge (*Perdix perdix*), great bustard (*Otis tarda*) and red-

FAMILIES, GENERA, SPECIES	LOCALITY				
	BABJA JAMA	CIGANSKA JAMA	JAMA POD HERKOVIMI PEČMI	LUKENJSKA JAMA	ŽUPANOV SPODMOL
ANATIDAE					
CYGNUS CYGNUS	■				
ANAS PLATYRHYNCHOS				■	
ACCIPITRIDAE					
AQUILA CHYSAETOS				■	
FALCONIDAE					
FALCO SUBBUTEO				■	
TETRAONIDAE					
LAGOPUS LAGOPUS	■	■	■	■	
LAGOPUS MUTUS		■	■		■
TETRAO UROGALLUS			■		
LYRURUS TETRIX			■		■
PERDIX PERDIX					■
OTIDIDAE					
OTIS TARDA					■
TURDIDAE					
TURDUS MERULA	■				
LANIIDIDAE					
LANIUS EXCUBITOR				■	
CORVIDAE					
PYRRHOCORAX PYRRHOCORAX					■
CORVUS CORAX				■	

Table 1.

FAMILIES, GENERA, SPECIES	BIOTOPES					RECENT CLIMATIC ZONES					PREY OF HUNTERS
	WATER MEDIUM	OPEN AREAS	REGION OF WOOD	ROCKY AREAS	MIXED BIOTOPE	TUNDRA	BOREAL ZONE	HIGH MOUNTAIN/ ALPINE ZONE	STEPPE	MODERATE ZONE	
ANATIDAE											
CYGNUS CYGNUS	■						●				▲
ANAS PLATYRHYNCHOS	■					●					▲
ACCIPITRIDAE											
AGILA CHRYSAETOS				■						●	
FALCONIDAE											
FALCO SUBBUTEO			■							●	
TETRAONIDAE											
LAGOPUS LAGOPUS		■				●	●				▲
LAGOPUS MUTUS				■				●			▲
TETRAO UROGALLUS			■							●	▲
LYRURUS TETRIX			■							●	▲
PERDIX PERDIX		■								●	▲
OTIDIDAE											
OTIS TARDA		■							●		▲
TURDIDAE											
TURDUS MERULA					■					●	
LANIIDAE											
LANIUS EXCBITOR					■					●	
CORVIDAE											
PYRRHOCORAX PYRRHOCORAX				■				●			
CORVUS CORAX				■						●	

Table 2.

billed chough (*Pyrrhocorax pyrrhocorax*), and they belong to three families - Tetraonidae, Otididae and Corvidae.

Some bird species show the existence of the different ecological niches in the Paleolithic. The majority of the caves are surrounded by different biotopes (water medium-environment - rivers, ponds, swamps; open areas - grassy slopes, lowlands and glades; forests - deciduous trees and coniferous; rocky areas) (Table II.). Thus, the nearness of the water biotope suggest two bird species: whooper swan (*Cygnus cygnus*) and mallard (*Anas platyrhynchos*). The open environment (meadows, glades, etc.) were inhabited by willow grouse (*Lagopus lagopus*), common partridge (*Perdix perdix*) and great bustard (*Otis tarda*). The characteristic forest biotope suggest three bird species: capercaillie (*Tetrao urogallus*), black grouse (*Lyrurus tetrix*) and hobby (*Falco subbuteo*). Four birds show the existence of the rocky areas in the neighbourhood of the cave, and they are: golden eagle (*Aquila chrysaetos*), ptarmigan (*Lagopus mutus*), red-billed chough (*Pyrrhocorax pyrrhocorax*) and raven (*Corvus corax*). The birds which are not strictly connected to a particular biotope or often inhabit the border zones between two biotopes (forest - meadow, rocks - forest) are: blackbird (*Turdus merula*) and great grey shrike (*Lanius excubitor*).

Single bird species are significant climate indicators, which show the climate changes during the sedimentation of the Paleolithic deposits (Table II.). Thus, some birds are representatives of the cold climatic areas - tundra, and boreal climate, and high-alpine climate. Although rare, these cold-climate representatives are very significant, and they are: whooper swan (*Cygnus*

<i>Cygnus cygnus</i> (Linné)	- Whooper swan - žutokljuni labud
<i>Anas platyrhynchos</i> (Linné)	- Mallard - divlja patka
<i>Aquila chrysaetos</i> (Linné)	- Golden eagle - suri orao
<i>Falco subbuteo</i> (Linné)	- Hobby - soko grlaš
<i>Lagopus lagopus</i> (Linné)	- Willow grouse - močvarna snježna jarebica
<i>Lagopus mutus</i> (Montin)	- Ptarmigan - alpska snježna jarebica
<i>Tetrao urogallus</i> (Linné)	- Capercaillie - veliki tetrijeb
<i>Lyrurus tetrix</i> (Linné)	- Black grouse - mali tetrijeb
<i>Perdix perdix</i> (Linné)	- Common partridge - trčka
<i>Otis tarda</i> (Linné)	- Great bustard - veliki potrk
<i>Turdus merula</i> (Linné)	- Blackbird - crni kos
<i>Lanius excubitor</i> (Linné)	- Great grey shrike - veliki svračak
<i>Pyrrhocorax pyrrhocorax</i> (Linné)	- Red-billed chough
<i>Corvus corax</i> (Linné)	- Raven - gavran

Table 3. Descriptions of species, authors, English and Croate names of birds.

cygnus), mallard (*Anas platyrhynchos*), willow grouse (*Lagopus lagopus*), ptarmigan (*Lagopus mutus*) and red-billed chough (*Pyrrhocorax pyrrhocorax*). The only representative of the steppe climate zone is great bustard (*Otis tarda*). The most numerous bird species (8) suggest the temperate climate: golden eagle (*Aquila chrysaetos*), hobby (*Falco subbuteo*), capercailzie (*Tetrao urogallus*), black grouse (*Lyrurus tetrrix*), common partridge (*Perdix perdix*), blackbird (*Turdus merula*), great grey shrike (*Lanius excubitor*) and raven (*Corvus corax*).

Particular bird species had great importance in the Paleolithic inhabitant diet (Table II.). This could be seen from the relative number of the skeletal remains of the so-called hunting birds, which are represented by eight species: whooper swan (*Cygnus cygnus*), mallard (*Anas platyrhynchos*), willow grouse (*Lagopus lagopus*), ptarmigan (*Lagopus mutus*), capercailzie (*Tetrao urogallus*), black grouse (*Lyrurus tetrrix*), common partridge (*Perdix perdix*) and great bustard (*Otis tarda*).

At the end it can be concluded that the determination of the bird skeletal remains from five Slovenian Paleolithic localities gives the following results:

- 8 families, with 13 genera and 14 species have been determined;
- all ecosystems are represented with almost equal numbers of the bird species;
- the important indicators of the colder climatic conditions are represented with 5 species;
- the hunting birds belong to three families: *Anatidae*, *Tetraonidae* and *Otididae*.

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Povzetek

V članku so prikazani rezultati novih paleoornitoloških raziskav iz petih slovenskih jam - paleolitskih postaj: Babje jame, Ciganske jame, Jame pod Herkovimi pečmi, Lukenjske jame in Županovega spodmola. Do sedaj so bili iz Slovenije znani ptičji ostanki iz 4 paleolitskih postaj, in sicer vsega skupaj 21 vrst. Z novimi raziskavami je bilo določenih 8 družin, 13 rodov in 14 vrst. Med njimi jih je 5 pokazateljev hladnejše klime, enakomerno pa so zastopani predstavniki vseh ekosistemov. Lovski plen pripada družinam *Anatidae*, *Tetraonidae* in *Otididae*.