



Article

Bird remains from the Mesolithic site Galgenbühel / Dos de la Forca (Salurn, Bozen/Bolzano, Italy)

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Key words

- Early Mesolithic
- Adige Valley
- rock shelter
- Aves
- palaeoecology

Parole chiave

- Mesolitico antico
- Valle dell'Adige
- riparo
- Aves
- paleoecologia

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Summary

As part of the research project "Living near the water", focused on the Early Mesolithic rock shelter of Galgenbühel/Dos de la Forca located at Salorno, in the Adige Valley (Bozen/Bolzano Province, Northern Italy), about 600 bird remains recovered from the excavations have been analyzed. The 27 identified species belong mainly to Passeriformes (about 250 specimens). The remains of Piciformes, Galliformes (among which the quail, *Coturnix coturnix*, is prevalent) and Gruiformes (belonging to the Rallidae family) are less abundant. Anseriformes, Suliformes, Podicipediformes, Charadriiformes, Columbiformes, diurnal (Accipitriformes and Falconiformes) and nocturnal raptors (Strigiformes) are represented in lower percentages. Forest species are the most frequent, but also species living in other biotopes, such as aquatic and open habitat birds, have been identified; rocky and mountain environments are represented by only two species. The taphonomic analyses did not allow defining the degree of human involvement in the accumulation of the bird bone assemblage.

Riassunto

Nell'ambito del progetto di ricerca "Vivere vicino all'acqua", finalizzato allo studio del riparo sotterraneo di Galgenbühel / Dos de la Forca, localizzato a Salorno, nella Valle dell'Adige (Provincia di Bolzano) e oggetto di frequentazione antropica nel Mesolitico antico, sono stati analizzati circa 600 resti di uccelli recuperati nel corso degli scavi. Le 27 specie individuate appartengono principalmente ai Passeriformes (circa 250 resti). Molto meno abbondanti sono i resti di Piciformes, i Galliformes (tra i quali domina la quaglia, *Coturnix coturnix*) ed i Gruiformes (appartenenti alla famiglia dei Rallidae). Sono presenti in percentuali minori Anseriformes, Suliformes, Podicipediformes, Charadriiformes, Columbiformes, rapaci diurni (Accipitriformes e Falconiformes) e notturni (Strigiformes).

Prevalgono specie boschive, ma sono presenti anche uccelli che frequentano altri biotopi, soprattutto quello acquatico e gli spazi aperti; habitat rocciosi e di montagna sono rappresentati da due sole specie. L'analisi tafonomica condotta su un campione di ossa non ha permesso di definire il grado di coinvolgimento antropico nell'accumulo di questi reperti.

Redazione: Giampaolo Dalmeri

pdf: http://www.muse.it/it/Editoria-Muse/Preistoria-Alpina/Pagine/PA/PA_48-2016.aspx



Fig. 1 - Location of the Galgenbühel/Dos de la Forca site in the Adige Valley (Bozen/Bolzano Province, Italy). / Localizzazione del sito Galgenbühel/Dos de la Forca nella Valle dell'Adige (Bolzano, Italia).

Introduction

The present research focuses on the study of the avifaunal assemblage recovered during the archaeological excavations in the Galgenbühel/Dos de la Forca rock shelter located at Salurn/Salorno (Bozen/Bolzano, South Tyrol, Italy) (Fig. 1). The site, frequented by Early Mesolithic hunter-fisher-gatherer groups, is placed in the Adige Valley, above a debris cone at 225 m a.s.l., at the foot of a steep rock face (Fig. 2). Deeply covered by debris, the deposit was discovered and partially destroyed during the activity of a gravel quarry ("Cava Girardi") in 1995. The excavation, carried out between 1999 and 2002 in four excavation seasons, was directed by the Ufficio Beni Archeologici of the Autonomous Bolzano Province (Bazzanella & Wierer, 2001; Bazzanella *et al.* 2004).

The excavated area ranges from 4 m² in the upper part of the deposit, to a maximum of 18 m² in the lower part; unfortunately the original extension of the anthropogenic layers could not be assessed. The anthropogenic levels, interspersed with natural layers of coarse grained debris, form a stratigraphic series with an approximate depth of 2.5 m evidencing a discontinuous human occupation (Fig. 3). Radiocarbon dates, recently integrated by new results, cluster between 8454 ± 46 BP uncal. (7588-7459 cal. BC) and 9265 ± 70 BP uncal. (8699-8301 cal. BC) and indicate human frequentation from the late Preboreal to the mid-Boreal. Several hearths, levels rich in charcoal and ash as well as lenses of burnt sediment are due to repeated fire activity (Coltorti *et al.* 2009). The lithic industry is made employing chert varieties coming from the Cretaceous formations of the Trento platform. The identified provenance areas - the neighbouring Non Valley and the about 40 km distant area of Mount Finonchio - Folgaria Plateau - provide a clue about the minimum



Fig. 2 - View of the valley bottom near Salurn/Salorno. The arrow indicates the residual debris cone where the site is located (Photo by U. Wierer). / Vista del fondovalle vicino Salorno. La freccia indica il conoide detritico residuale dove il sito è localizzato (Foto U. Wierer).

mobility range of the groups. Based on the techno-typological features, the industry is referable to the Sauveterrian techno-complex. The lithic production focuses on bladelet manufacture by means of three different reduction sequences. Among the retouched implements, the common tools, mostly denticulates, dominate over microlithic armatures (Bertola *et al.* 2006; Wierer, 2007, 2008; Wierer & Bertola 2016).

The limestone substratum at Galgenbühel allowed a good preservation of the faunal remains, mostly identifiable as waste from human processing. The abundant fish assemblage is dominated by the pike and by several *Cyprinidae* species, including the rudd and the roach, all species living in standing and slow-flowing waters. The nearly exclusive presence of pike bones in phases 4 and 5 indicates a marked specialization in pike fishing (Bazzanella *et al.* 2006, 2007). Hunting and collecting aquatic and semi-aquatic fauna are further documented by the numerous beaver bones, by the otter and the *Emys orbicularis* remains as well as by abundant fragments of *Unio* and *Anodonta* shells (Wierer & Boscato 2006; Girod & Wierer 2012). Ungulate hunting focused mainly on species living in the valley bottom and on the valley slopes, such as wild boar, red deer, and chamois. Taphonomic analyses of *Felis silvestris* provided evidence of carcass treatment of fur-bearing small preys (Crezzini *et al.* 2014). In sum, the species spectrum of Galgenbühel is the result of an economy focusing on wetland and valley bottom resources (Wierer *et al.* in press a). The lack of significant data related to the exploitation of rocky and mountain environments can be explained by the fair distance from high altitude territories (Boscato & Wierer 2009).

Materials and methods

Archaeological excavations were carried out following the stratigraphic units of the deposit. The spatial recording method consisted in the application of a three-dimensional grid, with a spatial excavation unit of 0.5 x 0.5 m. The entire excavated sediment underwent water screening with 1 mm mesh. In order to grasp diachronic changes along the sequence, the excavation units were grouped into 5 different phases, each one representing a palimpsest (Fig. 3).

The bird assemblage was analyzed using the osteological reference collection of the *Museo Nazionale Preistorico Etnografico L. Pigorini* and of the *Istituto Italiano di Paleontologia Umana* in Rome.

The taxonomic list and the relative nomenclature follow the indications of Clements *et al.* (2014). The Minimum Number of Individuals (MNI) was calculated separately for each phase. The data regard-

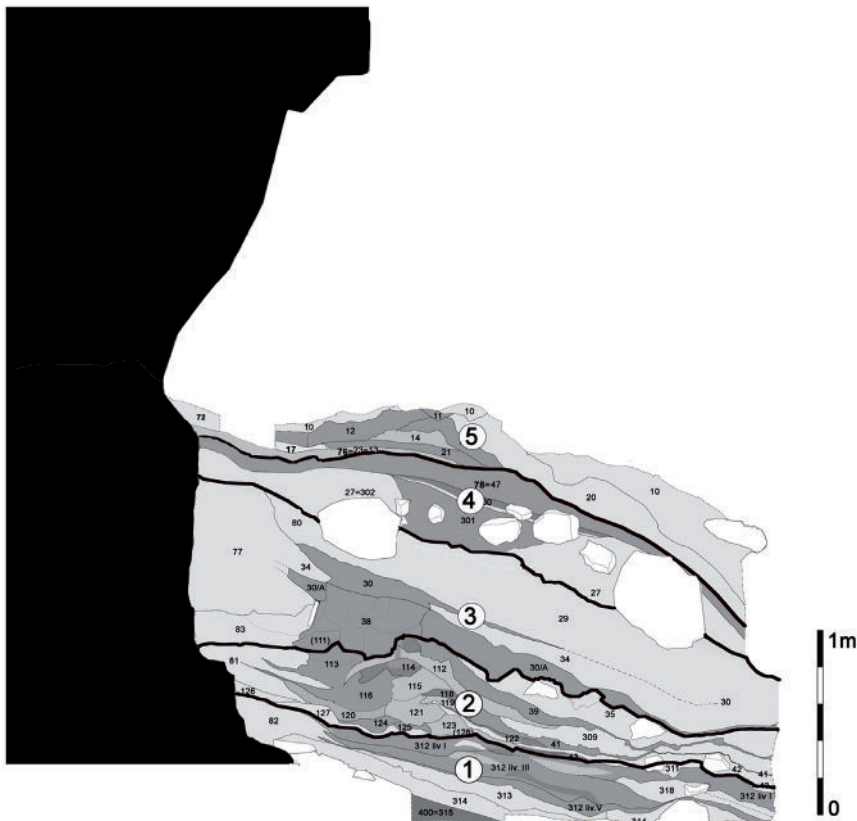


Fig. 3 -The stratigraphic sequence of Galgenbühel/Dos de la Forca subdivided into 5 phases. ^{14}C -AMS dates by ETH Zürich and CEDAD Università del Salento, dendrochronological calibration (2 σ) with Oxcal (Bronk Ramsey 2009) (Drawing by U. Wierer). / La sequenza stratigrafica di Galgenbühel/Dos de la Forca suddivisa nelle 5 fasi. Datazioni ^{14}C - AMS (ETH Zürich e CEDAD Università del Salento), calibrazioni dendrocronologiche (2 σ) con Oxcal (Bronk Ramsey 2009) (Disegno U. Wierer).

ing habitat and biology are taken from Spagnesi & Serra (2003-2005) and Spina & Volponi (2008). In order to determine the origin of the accumulation of the bird bone assemblage in the shelter various methods have been employed: spatial distribution, skeletal part representation, bone fragmentation and taphonomy. Bone surfaces were analyzed with a Nikon SMZ 1000 stereomicroscope (15-35x).

Seasonality analyses of the bird remains are object of a specific paper (Wierer *et al.* in press b).

Results

The number of bird remains from the Mesolithic site of Dos de la Forca is about 600 (Tab. 1), spanning the entire period of human occupation, from phase 1 to 5, being particularly numerous in phase 2 (NISP 261) and phase 3 (NISP 182).

The taxonomic identification was possible for 63% of the whole sample (NISP 373); the unidentified remains (NISP 225) consist of diaphysis fragments, phalanges and vertebrae. Twenty-seven species, 20 genera and 14 orders were identified in the bird assemblage. The most represented order is that of the Passeriformes (NISP 248), followed by Piciformes (NISP 32), Galliformes (NISP 27), Gruiformes (NISP 14), Accipitriformes (NISP 10), Columbiformes (NISP 10), Charadriiformes (NISP 9), Strigiformes (NISP 9), Anseriformes (NISP 5), Suliformes (NISP 2), Podicipediformes (NISP 1) and Falconiformes (NISP 1). The Minimum Number of Individuals (MNI) varies if calculated on the basis of the provenience of the remains from each stratigraphic unit (MNI 58), from each sub-phase (MNI 50) or considering only the 5 phases (MNI 44). As already mentioned in the methodological section, for this paper only this latter and lowest MNI was considered (Tab.1).

The bird assemblage is dominated by woodland species found in all phases (Fig. 4). Among these the black grouse (*Tetrao tetrix*) and the fieldfare (*Turdus pilaris*) were identified, as well as some species nesting in broad-leaved tree forest, like the common wood-pigeon (*Columba palumbus*), the Eurasian scops owl (*Otus scops*), the Eurasian jay (cf. *Garrulus glandarius*), and the Eurasian bullfinch (*Pyrrhula pyrrhula*). The green woodpecker (*Picus viridis*) is also present in mixed woodland and in the valley bottom, while the European nightjar (*Caprimulgus europaeus*) prefers the sunny and dry hillsides. The Eurasian blackbird (*Turdus merula*), the mistle thrush (*Turdus viscivorus*), and the redwing (*Turdus iliacus*) often frequent woodlands, but also open spaces.

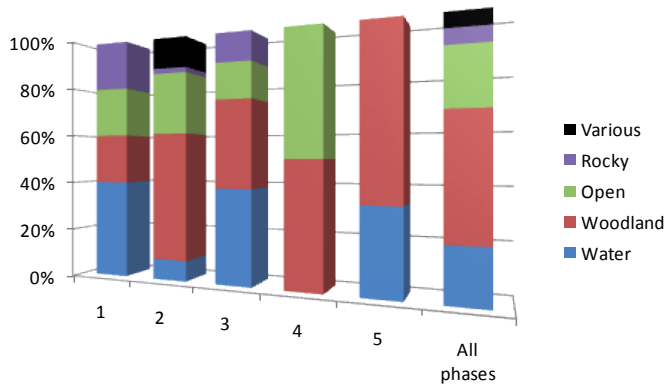
Water birds, though less numerous than woodland species, are present in appreciable percentages in phases 1, 3 and 5, but are absent in phase 4. The assemblage includes the green-winged teal (*Anas crecca*) and two other ducks (probably the Eurasian wigeon, *A. penelope* and the garganey, *A. querquedula*), the little grebe (*Tachybaptus ruficollis*), the cormorant (*Phalacrocorax cf. carbo*), the spotted crake (*Porzana porzana*) and the common sandpiper (*Actitis hypoleucos*). The short-eared owl (*Asio cf. flammeus*), found usually in wetlands, but related to open country and grasslands, has been dubitatively identified.

The birds typical of open habitat and prairies, like the common quail (*Coturnix coturnix*), are particularly frequent in phase 4, but absent in phase 5. In phase 3 the blue rock-thrush (*Monticola solitarius*), typical of rocky and barren environment, has been recovered, while in phases 1 and 2 the golden eagle (*Aquila cf. chrysaetos*) and the Alpine chough (*Pyrrhocorax graculus*), both common in the mountains of South Tyrol, have been found.

In sum, without considering phase 1 for the low number of bird remains, all phases show a nearly constant prevalence of woodland

Tab. 1 - Bird bones of Galgenbühel/Dos de la Forca recorded by order, family and species. / Resti di uccelli di Galgenbühel/Dos de la Forca suddivisi per ordine, famiglia e specie.

Taxa	Phases						Total	MNI
	1	2	3	4	5	1-5		
	NISP						NISP	
Anseriformes								
<i>Anas cf. penelope</i>			1		1		2	2
<i>Anas cf. querquedula</i>					1		1	1
<i>Anas crecca</i>			1				1	1
Anatidae indet.		1					1	
Galliformes								
<i>Coturnix coturnix</i>	1	12	5	5			23	5
<i>Tetrao tetrix</i>	1			3			4	3
Podicipediformes								
<i>Tachybaptus ruficollis</i>		1					1	1
Suliformes								
<i>Phalacrocorax cf. carbo</i>		2					2	2
Accipitriformes								
<i>Aquila cf. chrysaetos</i>	1						1	1
Accipitridae indet.	2		3	1	2	1	9	
Gruiformes								
<i>Porzana porzana</i>			4				4	1
<i>Porzana</i> sp.	2		1				3	
Rallidae indet.		2	4	1			7	
Charadriiformes								
<i>Actitis hypoleucos</i>			6				6	1
Scolopacidae indet.	1	1					2	
Charadriiformes indet.		1					1	
Columbiformes								
<i>Columba livia/oenas</i>		2		1			3	
<i>Columba palumbus</i>		1					1	1
<i>Columba cf. palumbus</i>		3	2	1			6	4
Strigiformes								
<i>Otus scops</i>		2	3		1		6	3
<i>Asio cf. flammeus</i>					1		1	1
Strigidae indet.		1	1				2	
Caprimulgiformes								
<i>Caprimulgus europeus</i>			1		2		3	2
Apodiformes								
<i>Apus apus</i>		1					1	1
Piciformes								
<i>Picus viridis</i>		7					7	1
<i>Picus</i> sp.		1	1				2	
Piciformes indet.		19	2	2			23	
Falconiformes								
Falconidae indet.	1						1	
Passeriformes								
<i>cf. Garrulus glandarius</i>		5					5	1
<i>Pyrrhocorax graculus</i>		1					1	1
<i>Corvus corone</i>			1		1		2	2
Corvidae indet.			2	1			3	
<i>Monticola solitarius</i>			4				4	1
<i>Turdus merula</i>		2			1		3	2
<i>Turdus pilaris</i>		1					1	1
<i>Turdus iliacus</i>		3	5				8	2
<i>Turdus cf. iliacus</i>						1	1	
<i>Turdus viscivorus</i>		1					1	1
<i>Turdus</i> sp.						1	1	
Turdidae indet.			1			2	3	
<i>Sturnus vulgaris</i>		5					5	1
<i>Pyrrhula pyrrhula</i>				1			1	1
Fringillidae indet.		6				1	7	
Passeriformes indet.	4	74	73	32	20		203	
Unidentified bird	9	106	61	23	26		225	
Total	22	261	182	71	61	1	598	44



Habitat	Phases					All phases
	1	2	3	4	5	
Water	40,0	8,3	38,2	0	33,3	20,8
Woodland	20,0	52,1	35,3	50,0	66,7	46,2
Open	20,0	25,0	14,7	50,0	0	21,7
Rocky	20,0	2,1	11,8	0	0	5,7
Various	0	12,5	0	0	0	5,7
Total %	100	100	100	100	100	100
Total NISP	22	261	182	71	61	598

Fig. 4 - Biotopes represented by the bird assemblage of the 5 phases. / Biotopi rappresentati nelle 5 fasi.

species. These are followed by birds of open habitat and by water fowl in variable frequencies, the former well represented in phases 2 and 4, the latter in phases 3 and 5.

As far as age determination is concerned, adult specimens dominate the assemblage; only 18 juvenile bones were identified, all coming from phases 2 and 3. The specimens belong to Anatidae indet. (carpometacarpus), Rallidae indet. (humerus), cormorant (mandible), little grebe (tarsometatarsus), Columbiformes of the size of the wood pigeon (scapula, tarsometatarsus and 3 coracoids, see one of these in figure 5), Columbiformes of the size of the pigeon/stock dove (tarsometatarsus) and from different sized small Passeriformes (coracoid, 3 humeri, carpometacarpus, femur, tibiotarsus and tarsometatarsus). The sex of few individuals could be assessed on the basis of medullary bone, a secondary woven bony tissue that forms in the marrow cavity of female birds during the breeding season (Rick 1975; Driver, 1982; Eda *et al.* 2010). This is the case for two black grouse remains (ulna and carpometacarpus) in phase 4v (Fig. 6).

As regards the distribution of bird remains within the site, they are present in SUs with hearths, associated with lithic industry and faunal remains resulting from human processing. If we consider phase 2, the richest among the five phases as number of remains, it is possible to observe a high concentration of specimens in squares G12 and G13 (Fig. 7). Especially in the latter one there are 141 elements, representing 54% of the 261 total remains, concentrated in quadrants G13 III (65 specimens) and G13 IV (55). Numerous bones were found also in quadrants G 12 I (18 specimens) and II (34 specimens).

Such distribution is also partially valid in the following phase 3, where half of the avian remains recovered (91 out of 182) was concentrated in the same squares and quadrants. In phase 4 the absence of bird remains in these squares should be emphasized, but



Fig. 5 - Coracoid of a juvenile individual of Columbiformes (Photo by M. Gala). / Coracoide di individuo giovanile di Columbiformes (Foto M. Gala).

in the rest of the excavation no other concentration of bones occurs and the specimens are evenly distributed in the adjacent squares.

It should also be noted that during the excavation no bones in clear anatomical connection were recovered, however during the analysis it was sometimes possible to assign the anatomical elements to a single anatomical portion of the same individual.

Analyzing body part representation, humeri and foot phalanges are the most frequent elements; tarsometatarsi and tibiotarsi are also abundant (Tab. 2). Some species are represented only by wing or hind limb bones (e.g., black grouse in the first case and Eurasian jay in the second), but given the low number of bone remains it is difficult to interpret such skeletal representation.

The analysis of the bird bone surfaces indicated erosive alterations, often limited to small areas, but in some cases more extensive.

Combustion traces were observed on 6 specimens (2 coracoids, scapula, humerus, carpometacarpus, tibiotarsus) of common quail and rail and on 3 shafts of unidentified birds. However, such traces, are not localized on portions such as those usually resulting from cooking on a fire or on coals before consumption, for instance on the articular ends of the meatiest elements (mainly humerus, coracoid, femur, and tibiotarsus) (Cassoli & Tagliacozzo 1997). Furthermore, the presence of 8 completely burned bones from the same stratigraphic unit (SU38), including 4 rear phalanges of diurnal raptors (large sized Accipitriformes) has to be mentioned.



Fig. 6 - *Carpometacarpus* of black grouse (*Tetrao tetrix*) with detail of medullary bone. (Photo by I. Fiore). / *Carpometacarpo* di fagiano di monte (*Tetrao tetrix*) con particolare dell'osso midollare (Foto I. Fiore).

Damage produced by carnivore activity on the bird bones was rarely observed: 3 specimens (Eurasian widgeon, black grouse and quail) and 2 shafts of unidentified birds show gnaw marks. However, it is not possible to exclude that carnivores acted after the remains were discarded by humans.

Other bones show perforations, thinned fracture margins and very severe erosion, which are surface modifications typical of the action of raptors gastric juices: 5 specimens of rails, 2 remains attributable to quail, 3 to Passeriformes and 2 diaphyses of unidentified birds.

Discussion and conclusion

The bird associations identified reflect a varied environmental and geomorphological setting of the territory around the site. The predominance of woodland species in the assemblages is in line with the Early Holocene forestation of the valley bottom and slopes (Cattani 1977, 1994; Tinner & Vescovi 2007; Kompatscher & Oeggli 2005), interrupted by open environments and by standing and slow flowing waters forming attractive habitats for species such as the quail and water fowl. Besides the existence of various ecological niches, the variety of species may also be explained by the fact that the Adige valley is still now a very important route for migratory birds and represents a very appreciated stopover area. The recovery of bones belonging to young individuals, among which Columbiformes and small Passeriformes as the most frequent, and of medullary bones referable to breeding females (black grouse), suggests that some species used to nest close to the shelter during the summer (Serjeantson 1998).

The bird assemblage is the result of various accumulation agents. Some birds, such as crows (carrion crow and Alpine chough), raptors (golden eagle and owl), pigeons, and little Passeriformes may have died for natural causes, while for others that do not live in caves and shelters (ducks, common quail, black grouse, cormorant, little grebe, spotted crane, and common sandpiper), it is possible to hypothesize the involvement of a predator (humans, carnivores, raptors).

The position of combustion traces on the bones does not clearly indicate cooking for alimentary purposes and may have been the result of natural causes. The same hypothesis may not be valid for the completely burnt phalanges of large sized Accipitriformes that may have been used for ritual or cult purposes.

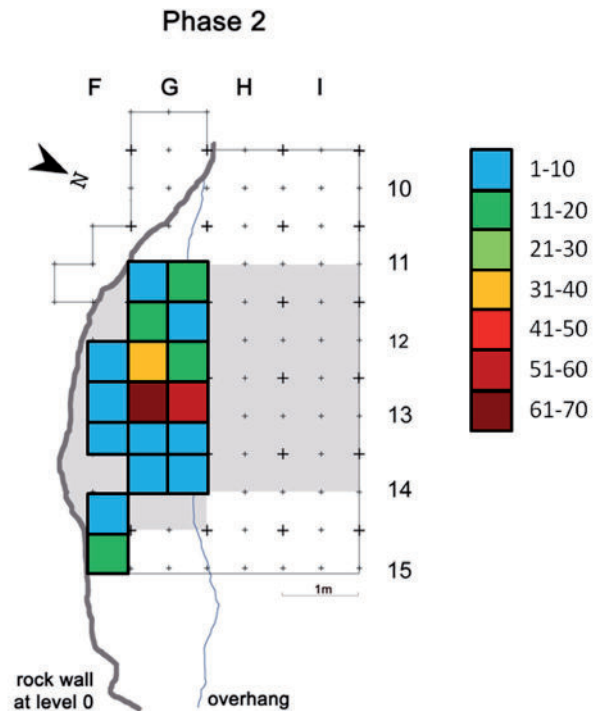


Fig. 7 - Spatial distribution of the bird remains of phase 2. Grid-ded area indicates area of excavation; grey areas indicate phase 2 excavation without bird remains; other colored squares indicate bird remains of variable frequency. / Distribuzione spaziale dei resti di uccelli nella fase 2. La quadrettatura indica l'area di scavo; le aree in grigio indicano la fase 2 senza resti di uccelli; i quadrati di altri colori indicano la frequenza dei resti di uccelli.

Given the concentration of bird remains in a limited area of the shelter that is repeated over two phases, it is not possible to exclude the presence of a raptor roost and therefore a non-anthropogenic origin for part of the assemblage. On the other side, the fact that the bird bones were found in the archaeological levels associated to hearth structures, lithic artifacts and faunal remains with cut-marks and in relation with human activities, indicates that humans may have played a role in the accumulation of bird remains. Unlike fishing and mammal hunting, fowling was of secondary importance for the inhabitants of the rock shelter.

The bird assemblage of Dos de la Forca is the most abundant of the Northern Italian Mesolithic. Data from Riparo Soman (Verona) have been already published (Tagliacozzo & Cassoli 1994), while the assemblages from Pradestel, Riparo La Cogola and Vatte di Zambana (Trento) are being analyzed (Gala & Tagliacozzo in progress). With the exception of Pradestel that yielded over 200 bird remains, in the other sites very few bird remains have been collected. Only 4 specimens from level L of Pradestel have been attributed to Anseriformes. Their extreme fragmentation does not allow a sure specific attribution, but the size and some diagnostic features may be referable to a small duck (green-winged teal, *Anas crecca*). The remaining 96% of the identified specimens is attributable to the Passeriformes. At Riparo La Cogola a single specimen (posterior phalanx) from SU 16 attributed to the Early Sauveterian (9430 ± 60 BP uncal.), is currently being identified. Currently no data are available for Vatte di Zambana. At Riparo Soman only one remain of golden eagle was recovered.

At these sites, the preliminary taphonomic studies did not allow to suggest human activity. New research projects, currently still being defined, on the bird bones recovered in Early Mesolithic sites across the Italian peninsula, will allow framing the assemblage from Dos de la Forca within a wider context.

Tab. 2 - Skeletal part representation of the bird remains in the 5 phases. Head: CRA (skull, mandible, maxilla, quadrate). Axial: VER (Vertebra), RIB (Rib), STE (Sternum), PEL (Pelvis, synsacrum, notarium). Shoulder girdle: FUR (Furcula), COR (Coracoid), SCA (Scapula). Wing: HUM (Humerus), ULN (Ulna), RAD (Radius), CAR (Carpometacarpus) CRP (Carpal), W-P (Wing Phalanx). Hindlimb: FEM (Femur), TIB (Tibiotarsus), FIB (Fibula), TAR (Tarsometatarsus), MET (Metatarsal), F-P (Foot Phalanx). LB (long bone). / Rappresentazione scheletrica degli uccelli nelle 5 fasi. CRA (cranio, mandibola, mascella, osso quadrato). VER (Vertebra), RIB (Costa), STE (Sternum), PEL (Pelvis, synsacrum, notarium). FUR (Furcula), COR (Coracoide), SCA (Scapola). HUM (Omero), ULN (Ulna), RAD (Radio), CAR (Carpometacarpo) CRP (Carpale), W-P (Falange alare). FEM (Femore), TIB (Tibiotarso), FIB (Fibula), TAR (Tarsometatarso), MET (Metatarsale), F-P (Falange posteriore). LB (Osso lungo).

Taxa (NISP)	Head		Axial				Shoulder girdle			Wing						Hindlimb						Tot
	CRA	VER	RIB	STE	PEL	FUR	COR	SCA	HUM	ULN	RAD	CAR	CRP	W-P	FEM	TIB	FIB	TAR	MET	F-P	LB	
<i>Anas cf. penelope</i>												1			1							2
<i>Anas cf. querquedula</i>						1																1
<i>Anas crecca</i>						1																1
Anatidae indet.												1										1
<i>Coturnix coturnix</i>						1	5	2	2	2	1	1			1	6			2			23
<i>Tetrao tetrix</i>									1	2	1											4
<i>Tachybaptus ruficollis</i>																1						1
<i>Phalacrocorax cf. carbo</i>	1																			1		2
<i>Aquila cf. chrysaetos</i>												1										1
Accipitridae indet.	1	1									1			1						5		9
<i>Porzana porzana</i>												2			1	1						4
<i>Porzana sp.</i>								1	1						1							3
Rallidae indet.							1	1	2	1					1	1						7
<i>Actitis hypoleucos</i>												1			1	1		3				6
Scolopacidae indet.				1														1				2
Charadriiformes indet.															1							1
<i>Columba livia/oenas</i>						1											1			1		3
<i>Columba palumbus</i>													1									1
<i>Columba cf. palumbus</i>							3	1									2					6
<i>Otus scops</i>							1			1	2			1		1						6
<i>Asio cf. flammeus</i>									1													1
Strigidae indet.								1				1										2
<i>Caprimulgus europaeus</i>							1		1			1										3
<i>Apus apus</i>							1															1
<i>Picus viridis</i>							1	1	1	2	2											7
<i>Picus sp.</i>								1				1										2
Piciformes indet.		5		1		4	1	2			2			1	3		3		1			23
Falconidae indet.																				1		1
<i>cf. Garrulus glandarius</i>														1			1		3			5
<i>Pyrrhonorax graculus</i>					1																	1
<i>Corvus corone</i>											1			1								2
Corvidae indet.	1	1												1								3
<i>Monticola solitarius</i>							1		1	1		1										4
<i>Turdus merula</i>							2	1														3
<i>Turdus pilaris</i>								1														1
<i>Turdus iliacus</i>	1						1	2	1	1		1		1								8
<i>Turdus cf. iliacus</i>										1												1
<i>Turdus viscivorus</i>																1						1
<i>Turdus sp.</i>										1												1
Turdidae indet.									2						1							3
<i>Sturnus vulgaris</i>							1			2							2					5
<i>Pyrrhula pyrrhula</i>																	1					1
Fringillidae indet.									1													1
Passeriformes indet.	7	3		7	1	1	19	10	42	26	3	20		7	11	27		24		4		212
Unidentified bird	6	32	1	1	5		3	4	11	11	2	3	1	8	6	13	1	6	2	67	39	222
Total	17	42	1	10	7	3	47	26	67	48	13	42	2	16	26	51	1	53	2	85	39	598

Acknowledgements

This research is part of the project "Leben am Wasser. Ressourcen, Technik und Mobilität im Mesolithikum am Beispiel der Fundstelle Galgenbühel in Salurn (Südtirol)" funded by the Autonomous Bozen/Bolzano Province - South Tyrol, Higher Education Support, University and Research Office. The project was headed by the South Tyrol Museum of Archaeology; project partner was the Ufficio Beni Archeologici of Bolzano – South Tyrol.

We thank Ivana Fiore for the photographs, Alessia Nava and Francesca Alhaique for the translation.

M.G. and A.T. conducted research on the avifauna and wrote section 3, U.W. co-directed excavations, directed research project "Leben am Wasser" and wrote section 1. Sections 2 and 4 were elaborated jointly by the authors.

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