

# Archaeozoological evidence of dietary habits of small castle inhabitants in the medieval Slavonia

---

**Tkalčec, Tatjana; Trbojević Vukičević, Tajana**

*Source / Izvornik:* **Castrum Bene 16, Castrum and Economy, 2021, 124 - 152**

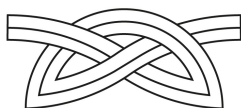
**Conference paper / Rad u zborniku**

*Publication status / Verzija rada:* **Published version / Objavljena verzija rada (izdavačev PDF)**

*Permanent link / Trajna poveznica:* <https://um.nsk.hr/um:nbn:hr:291:407098>

*Rights / Prava:* [Attribution 4.0 International](#)/[Imenovanje 4.0 međunarodna](#)

*Download date / Datum preuzimanja:* **2025-02-22**



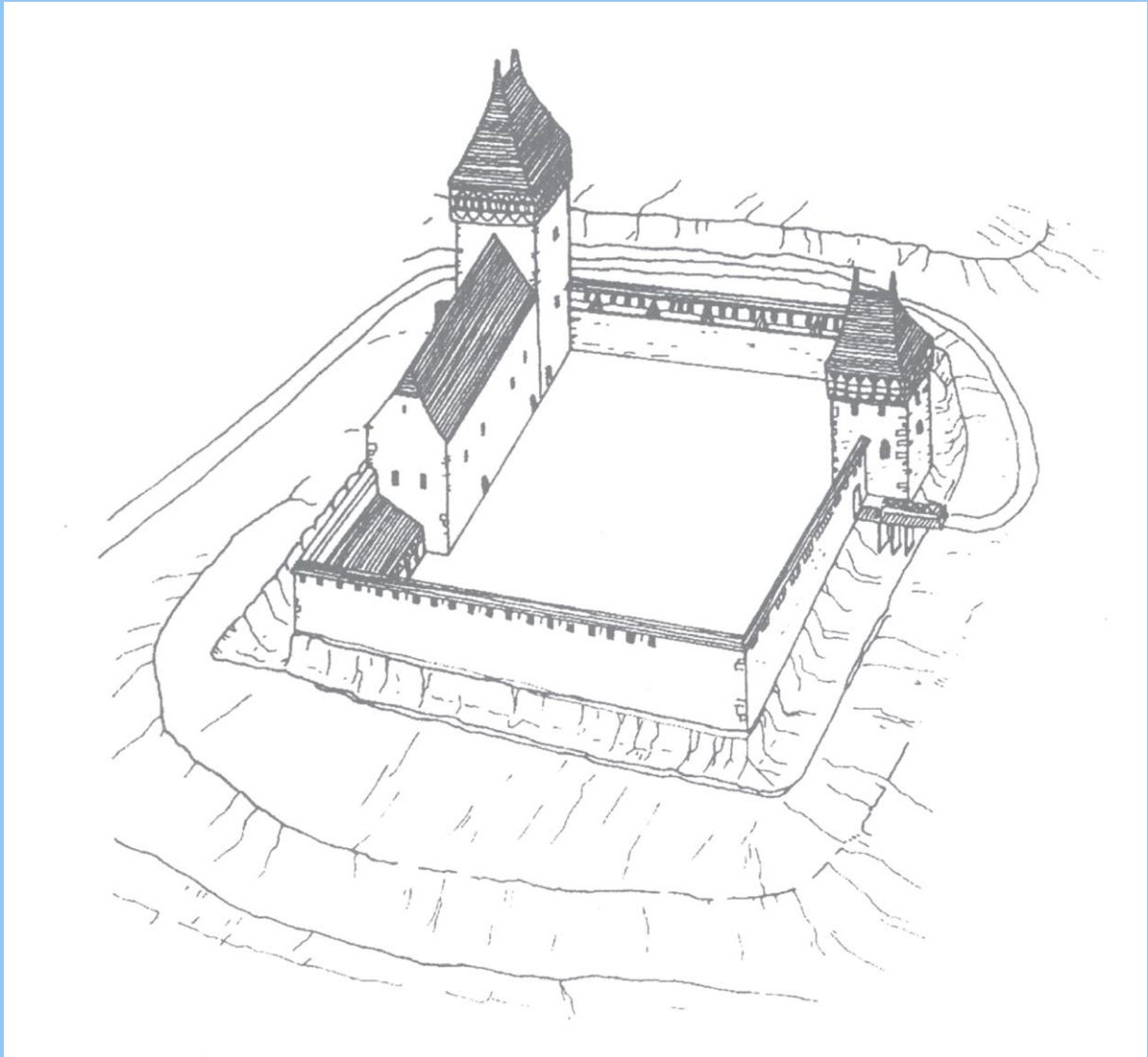
INSTITUT ZA  
ARHEOLOGIJU

*Repository / Repozitorij:*

[RIARH - Repository of the Institute of archaeology](#)

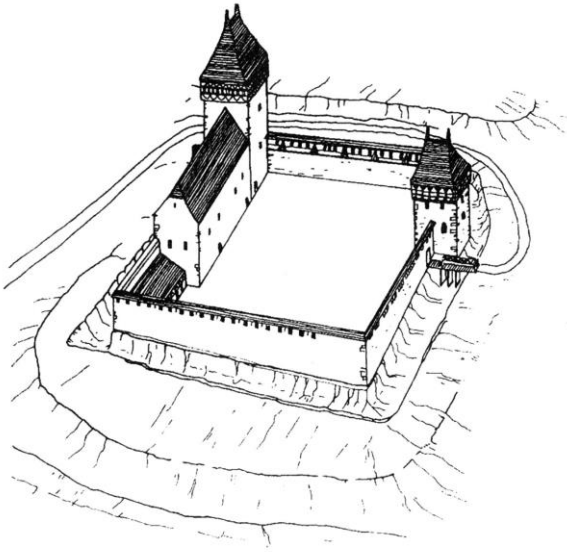


# Castrum Bene 16



**Castle and Economy**





# **Castrum Bene 16**

*Kutina – Sisak, Sisak-Moslavina County,  
Croatia  
May 21<sup>st</sup> – 25<sup>th</sup> 2019*

## **Castle and Economy**

Proceedings of The 16th International Castellological  
Conference

Popovača 2021

## Scientific organizing committee and Editorial Board

**Doc. Dr. Silvija Pisk**

Filozofski fakultet Sveučilišta u Zagrebu

**Dr Artur Boguszewicz**

Uniwersytet Wrocławski, Wydział Nauk Historycznych i Pedagogicznych, Katedra Etnologii i Antropologii Kulturowej

**PhDr. Peter Bednár, CSc.**

Archeologický ústav SAV

**PhDr. Zlata Gersdorfová**

Westböhmsche Universität Pilsen, Lehrstuhl für Archäologie

**Dr. István Feld**

Eötvös Loránd University, Faculty of Humanities, Institute of Archaeological Sciences,

**Mag. Dr. Martin Krenn**

Bundesdenkmalamt, Abteilung für Archäologie

**Doc. Dr. Katarina Predovnik**

Univerza v Ljubljani, Filozofska fakulteta, Oddelek za arheologijo

**Dr. Adrian Andrei Rusu**

Institutul de arheologie și istoria artei al Academiei Române

## CASTLE AND ECONOMY

Monograph Series, no.: Castrum Bene, 16

*Editor:* Silvija Pisk

*Reviewers:* Krešimir Filipec, Hrvoje Gračanin

*Translation:* Katarina Šturik - preface

*Translation and text editing:* Translated/edited by the authors

*Design and layout:* Stela Kos

*Published by:* Moslavina Museum Kutina, Historical Association Moslavina (PUM)

**CIP** available in National and University Library in Zagreb, no. 001106976

**ISBN:** 978-953-57553-4-0 (Povijesna udruga Moslavina)

978-953-7135-72-0 (Muzej Moslavine Kutina)



Castrum Bene 16 participants, Castle Ribnik

# Contents

**Silvija Pisk**

Preface

**Werner Meyer**

Wirtschaftliche Ursachen des Burgensterbens im Spätmittelalter – ein Überblick.....8

**Diana Duchoňová, Tünde Lengyelová**

Versorgung und Wirtschaftshintergrund der Burgen in Ungarn im 16. – 17. Jahrhundert.....28

**Dieter Barz**

Wirtschaftliche Aktivitäten in Burgen des 10./11. Jahrhunderts im archäologischen Kontext..46

**Adrian Andrei Rusu, Szócs Péter Levente**

Castles, gold- and gold-mining in Transylvania and the eastern parts of medieval Hungary....59

**Lukas Johannes Kerbler**

Die wirtschaftliche Bedeutung der Eisengewinnung und verarbeitung auf den mittelalterlichen Burgen Feinfeld und Sachsenhof, Niederösterreich.....77

**Pavol Maliniak**

From rise to decline? Some features of the management of Čabrad' estate in the Late Middle Ages and in the beginning of the Early Modern History.....99

**Danko Dujmović**

The network of trading places and castles in today's Moslavina region.....111

**Tatjana Tkalčec, Tajana Trbojević Vukičević**

Archaeozoological evidence of dietary habits of small castle inhabitants in the medieval Slavonia.....124

**Michael Rykl**

Die Feste als ein Speicher und der Speicher als eine Feste (nicht nur) in Böhmen.....153

**Jana Mazáčková, Petr Žaža, Daniela Vaněčková**

Life (inside) of the Rokštejn Castle.....181

**Dominik Nowakowski**

Die wirtschaftlichen Grundlagen der ländlichen Herrensitze Schlesiens im Spätmittelalter und in der frühen Neuzeit.....193

**Andrej Janeš**

The Castle Estate: A Self-sufficient or Dependent Economy – the Case Study of Grižane Castle in the Vinodol Valley.....219

**Sófalvi András**

Castles and Customs in the Middle Ages on the Southern Borders of Transylvania.....235

<b>Ádám Novák</b>	
The detailed survey of the three demesnes of the Perényi family until 1465.....	246
<b>Ivan Alduk</b>	
Financing the construction and maintenance of fortifications in Dalmatia in the 15th and 16th century - selected examples.....	263
<b>Felix Biermann, Normen Posselt</b>	
Burg, Schloss und Stadt in der Prignitz (Nordwestbrandenburg) – Ausgrabungen an einer mittelalterlichen Motte in Meyenburg.....	274
<b>Katarína Harmadyová</b>	
Belege der mittelalterlichen und frühneuzeitlichen Wirtschaftstätigkeit auf der Burg Theben (Devín) und in ihrem Hinterland.....	291
<b>Piotr Lasek</b>	
Aedificia ante castrum. Economic and auxiliary steadings of ducal Mazovian castles in the XVth and XVIth century.....	306
<b>Zlata Gersdorfová</b>	
Der Fall von Janowitz. Der Heerezug der böhmischen königlichen Städte gegen das Raubadel im Jahre 1520.....	321
<b>Szabolcs Balázs Nagy, Máté Varga</b>	
Counterfeiting and castle-building: synchron baronial trespasses at Várpalota? Traces of a special mint at the mid-15th-century residence of Nicholas Újlaki.....	332
<b>Artur Boguszewicz</b>	
Burgen aus der Sicht der Wirtschaftsanthropologie. Beispiel Schlesien.....	345
<b>Miroslava Cejpová</b>	
Die Bauform der Küchen auf den Adelssitzen in den tschechischen Ländern im 13. - 16. Jahrhundert.....	368
<b>Silvija Pisk</b>	
„Burg und Wirtschaft“ in schriftlichen mittelalterlichen Quellen – Fallstudie Regnum Sclavoniae.....	384
<b>Domagoj Pintač</b>	
Castrum Bene Conferences, 1989-2019.....	396
<b>Jan Salm</b>	
Drawings from the Conference Castrum Bene 16.....	405



Tatjana Tkalčec, Tajana Trbojević Vukičević

*Archaeozoological evidence of dietary habits of small castle inhabitants in the medieval Slavonia*

**1. Introduction**

The paper presents knowledge about the meat alimentation of the inhabitants of medieval fortifications in the area of the Kingdom of Slavonia (*regnum Sclavoniae*). Analyzed samples of animal bones originate from the archaeological sites Veliki Zdenci–Crni Lug, Grubišno Polje–Šuma Obrovi 1, Sveta Ana–Gradina and Osijek Vojakovački–Mihalj (Fig. 1).

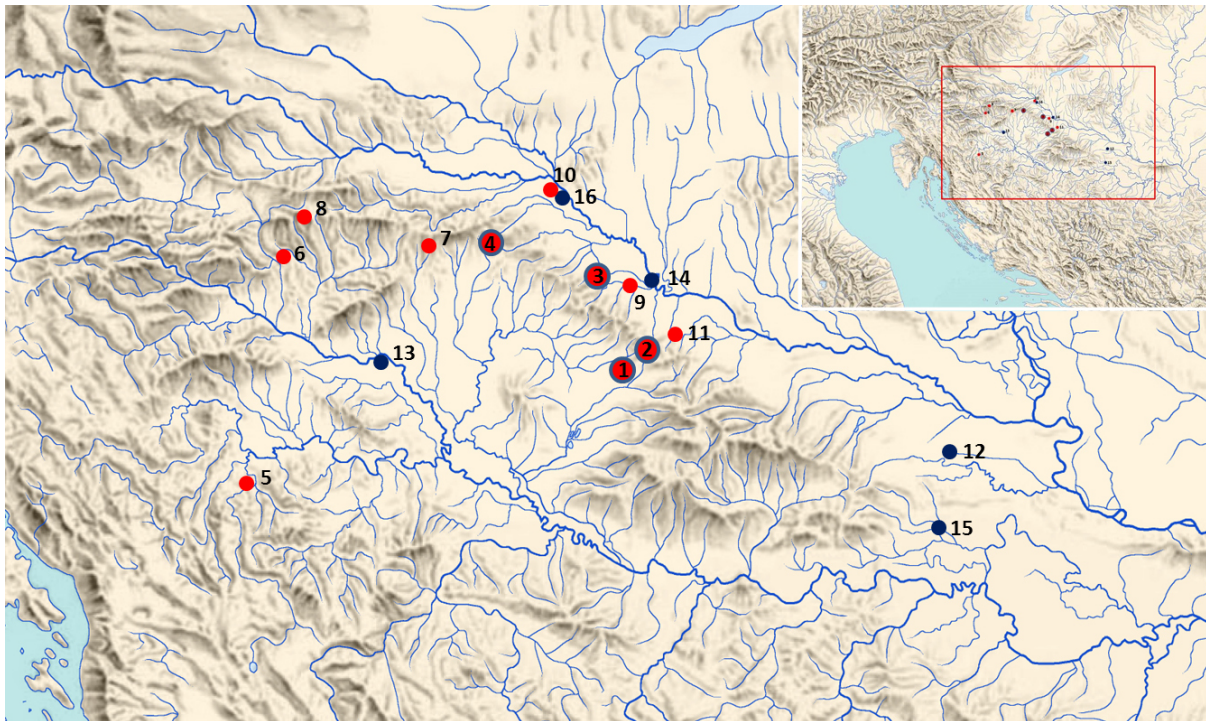


Fig. 1 The distribution of analysed and comparative sites: the elite sites (castles, forts) – 1. Veliki Zdenci–Crni Lug, 2. Grubišno Polje–Šuma Obrovi 1, 3. Sveta Ana–Gradina, 4. Osijek Vojakovački–Mihalj, 5. Barilović Castle, 6. Cesargrad Castle, 7. Čanjevo Castle, 8. Klenovec Humski–Vrbovec Castle, 9. Kloštar Podravski–Gorbonok, 10. Torčec–Gradić, 11. Virovitica Castle; the non-elite sites (rural settlements) – 12. Beketinci–Bentež, 13. Kobilic 1, 14. Mekiš–Zgruti, 15. Stari Perkovci–Sela, 16. Torčec–Rudičevo (prepared by Tatjana Tkalčec)

All of them belong to so called high-status sites, inhabited by the social elite of the medieval Slavonia. Such fortified residences of the nobility, late medieval hill-forts or lowland small castles protected by the ditches and earthen ramparts, are particularly densely widespread in the area of the medieval Križevci County (*comitatus Crisiensis*) but only a few of them was surveyed using contemporary archaeological methods.<sup>1</sup> Finds like kitchen-ware and cutlery, drinking vessels, jewellery, weapons, tools and other items give insight into everyday life in the castles and into the quality of life of the nobility of the medieval Slavonia. In the archaeological literature more attention is devoted to the analysis of fortification elements of the castles and the analysis of small archaeological finds, especially the tableware which directly provides information about the status and the financial capability of the castle owners, while less attention is devoted to their dietary habits.

The aim of this paper is to present a picture of the eating habits of the owners and the inhabitants of the castle, based on analysis of animal bones remains. Meat has always represented the main source of proteins, and it can be assumed that because of its good taste it was the first choice between the various foods that a nobleman could want to have on his table. Thus faunal remains on the site represent an identifier of the social status of the site, e.g. castle inhabitants. Animal remains from the castle indirectly testify about the economy of the whole estate, respectively about the ecological attributes of the surroundings from which the castle was supplied with food. The focus of the study is put on the meat alimentation of the castle inhabitants, while other issues about ecology and economy of the castle environment which emerge from the obtained research results are annotated and shortly commented.

The use of bone remains for the identification of the social status of sites is well established method in the medieval archaeozoology. It was recognized that the social elite used selected group of animals in their alimentation and other (especially hunting) activities as expression of their distinct social identity and that there are clear differences in faunal assemblages from religious, rural and fortified sites, e.g. distinct differences between so called high status (monastic, royal and aristocratic residences as well as military centers), rural and urban settlements.<sup>2</sup> Our special interest was to attempt to get more information if and in what extent the faunal assemblages from the investigated small castles reflect the social standard and the character of the sites. The results of the analyses of the four small castles are also discussed in comparison to the available results of analyses of the faunal assemblages from other high-status sites as well as rural settlements on the area of the medieval Slavonia. Our analyses have objective limitations because rather smaller areas of the sites have been investigated and consequentially smaller assemblages of bone remains from different horizons in each locality have been found. For this reason, the conclusions serve only as an insight into the topic until future archaeological excavations generate quantitatively better representative samples for the observed area of medieval Slavonia.

---

<sup>1</sup> Tkalčec, Tatjana. "Small feudal residences in the North-Western Croatia: medieval hill forts and lowland moated fortifications." *Castrum Bene 13, Burg und Dokumentation*, 12. –16. Juni 2013, Krems an der Donau, Österreich, (forthcoming). 2019.

<sup>2</sup> Giovanni De Venuto, "To eat and to be in medieval southern Italy: the zooarchaeological contribution from religious, rural and fortified sites", in *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, eds. Günther Karl Kunst and Matthias Kucera (Wien: Vienna Institute for Archaeological Science, 2010), 55–61; André Rehazek and Elisabeth Marti-Grädel, "Animal remains reflecting different social identities: examples from sites in northern and western Switzerland", in *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, eds. Günther Karl Kunst and Matthias Kucera (Wien: Vienna Institute for Archaeological Science, 2010), 62–65; Bartosiewicz, László, „Animal husbandry and medieval settlement in Hungary. A Review“, *Beiträge zur Mittelalterarchäologie in Österreich* 15 (1999): 139–155.

## 2. Archaeological and archaeozoological evidence

The faunal remains originate from trial, mostly smaller scope archaeological excavations of four small castles of the middle and lower nobility conducted by the Institute of archaeology in recent period. The archaeological results and specific archaeological topics on these sites are presented in other places in more details<sup>3</sup> and here we point out just crucial information on the character of the sites and their stratigraphy in order of better understanding of the contexts from which the archaeozoological material originates.

When analysing the bone remains, the stratigraphy, the absolute radiocarbon dating of certain contexts and the typological characteristics of the other finds from the archaeological contexts were taken into consideration for each site. Thus, three horizons of habitation have been recognized. The earliest (13<sup>th</sup> to 14<sup>th</sup> century) is present at Veliki Zdenci–Gradina, Osijek Vojakovački–Mihalj and Sveta Ana–Gradina sites, the next horizon (end of the 14<sup>th</sup>–15<sup>th</sup> c.) has been recognized at the sites Veliki Zdenci and Mihalj and the youngest horizon (end of the 15<sup>th</sup>–beginning of the 16<sup>th</sup> c.) is represented by the Veliki Zdenci and Grubišno Polje–Šuma Obrovi 1 sites.

In our case for each archaeological site (per context and horizons) the number of identified specimens' for each animal species was determined (Tab.1) and in later analyses the sites are compared by the results of the number of identified specimens' percentage (%NISP).<sup>4</sup>

<sup>3</sup> Tatjana Tkalčec, „Probna arheološka istraživanja visinskog gradišta Sveta Ana – Gradina 2010,“ *Annales Instituti Archaeologici* 7 (2011): 45–49; Tatjana Tkalčec, „Kasnosrednjovjekovni arheološki kompleks Grubišno Polje – Šuma Obrovi – probna arheološka istraživanja u 2015,“ *Annales Instituti Archaeologici* 12 (2016): 99–112; Tatjana Tkalčec, „Arheološka istraživanja na lokalitetu Veliki Zdenci–Crni Lug 2018. godine,“ *Annales Instituti Archaeologici* 15 (2019): 107–116; Tatjana Tkalčec, „Arheološka istraživanja na srednjovjekovnome arheološkom kompleksu Osijek Vojakovački – Mihalj u 2018. godini,“ *Annales Instituti Archaeologici* 15 (2019): 153–166; Tatjana Tkalčec, „Earthwork elements of defensive systems of small strongholds in the Kingdom of Slavonia”, in *Fortifications, defence systems, structures and features in the past*, *Zbornik Instituta za arheologiju / Serta Instituti Archaeologici* 13, eds. Tatjana Tkalčec, Tajana Sekelj Ivančan, Siniša Krznar and Juraj Belaj (Zagreb: Institute of archaeology, 2019), 333–342; Tatjana Tkalčec, „A nemesség várai és kisebb erődített lakóhelyei Észak-Horvátországban az újabb régészeti adatok tükrében,“ *Castrum: a Castrum Bene Egyesület folyóirata* 22, no. 1-2 (2019): 33–51.

<sup>4</sup> Since the sample per location / period is relatively small, determining the minimum number of individuals (MNI) was not made. Although the values made by the counting the number of identified specimens may be quite influenced by the fragmentation of the bones, especially in case of large animals, which often leads to their overrepresentation in the particular faunal assemblages, some experts have come to conclusion that the values of minimum number of individuals can be very subjective and thus even less accurate (Bartosiewicz, „Animal husbandry,“ 142–143).

CONTEXT			ANIMAL SPECIES (Number of Identified SPecimens)								
Site	Horizon	Stratigraphic unit	Bos taurus	Sus domesticus	Ovis/Capra	Poultry	Game	Fish	Others	NISP	
VELIKI ZDENC I - CRNI LUG	I. - 13TH-14TH C.	36	5	6	3	2				16	
		61								0	
		22	1							1	
		23				1	1			2	
		24	1	1	1					3	
		27	4	1	2	3				10	
		37			1					1	
	II. - END 14TH - 15TH C.	2								0	
		2/9	1							1	
		9/10	3	3		2	2			10	
		9/19	1	3						4	
		10	2	9	1	3				15	
		13/14	10	9	1	2				22	
		14	3	2	1	4				10	
		15	15	8	4	8	6			41	
		17	5	2		1				8	
		18	4	4						8	
		19	7	1						8	
		21		3	2	1				6	
		28	1							1	
	35		1	2					3		
	III. - END 15TH - BEG. 16TH C.	1	4	1		1				6	
		3	5	3		1				9	
		4	1	4						5	
		8	3	1						4	
		11	2	4						6	
	GRUBIŠNO POLJE - ŠUMA OBROVI 1	III. - END 15TH - BEG. 16TH C.	1	3				1			4
			1/37								0
			7								0
			5			1					1
2/3, 5										0	
34			1							1	
34, SW										0	
34, phase III										0	
38			3	8		1				12	
39										0	
43			2	8		1				11	
45/77			2	12	1	1				16	

		46							0
		50	2				1		3
		51	2						2
		51, bottom	1	4	1	1			7
		53							0
		77	1	4	2		1		8
		80							0
SVETA ANA	13TH-14TH C.	1/2		5	2		1		8
		2	1	3	2				6
		3	1						1
		3/5		3			1		4
		6				1			1
		8		1	1				2
		10		1					1
		16	1	2	3				6
		18		2					1
		21	2	7	10	1	1		21
		24	6	61	20	80	12		179
		26		1					1
		VOJAKOVAČKI OSIJEK - MIHALJ	13TH-14TH C.	1	1	1	3		
9	1			1				1	3
9/18									0
12	1								1
14					2				2
16				2					2
17	1							8	9
32									0
37					1				1
45	2								2
48	1								1
64	7			2					9
1, by the wall 34									0
1, by the wall 49							1		1
14+64	1			2	1				4
29	2						2		

Table 1 The composition and distribution of the fauna from the sites by context and horizons



## 2.1. The Veliki Zdenci – Crni Lug site

The Veliki Zdenci fortification is located in the woods called Crni Lug (Black Woods). The central elevation of the circular layout of the fort is about 30 m in diameter and it overhangs the surrounding terrain for about 3.5 m. It is enclosed by three 2.5 to 1.5 m high earthen ramparts and 4–5 m wide ditches on the southern side, while a larger elevated plateau of an irregular lunate layout is situated on the north.<sup>5</sup> The ditches and moats around the fort were connected to the river Ilova, which was an additional defensive feature of the site in the Middle Ages. Scarce historical data mention *magister Moys* who owned his possessions on the territory of Zdenci in the 1<sup>st</sup> half of the 13<sup>th</sup> century, but the *castrum Zdenecz Inferior* is first mentioned by name in 1272.<sup>6</sup> The most historians have connected this historical data to the site Veliki Zdenci–Crni Lug but before archaeological excavation it was just a hypothesis. In the 14<sup>th</sup> century in this area nobles of *Morochida* have owned their possessions. Furthermore, historical sources give us data on an important event that happen in Zdenci in 1478 – there the Hungarian-Croatian Parliament held a session at which conclusions which point to the strategy of addressing various problems and protection of the country in the times of the Ottoman attacks have been reached. After that the *Bathory* family is mentioned on the territory of Zdenci, and around the mid of the 16<sup>th</sup> century Zdenci was occupied by the Ottomans.<sup>7</sup>

The probe archaeological trench (2 x 10 m) opened in the southern part of the central elevation has provided remarkable results. Although the investigated area was rather small, the richly deposited cultural layers showed the continuous stratigraphy from the 13<sup>th</sup> to the 16<sup>th</sup> century and were excavated to the depth of 3 meters (Fig. 2).



Fig. 2 Veliki Zdenci–Gradina: a view to a rich stratigraphy in the excavated trench (photo by Siniša Krznar)

<sup>5</sup> Tkalčec, “Arheološka istraživanja na lokalitetu Veliki Zdenci,” 108–109, Figs. 1–2.

<sup>6</sup> Danko Dujmović, “Zdenci u 13. i 14. stoljeću – prilog poznavanju kulturnog krajolika,” *Scrinia Slavonica* 18 (2018): 16–17, 20–21.

<sup>7</sup> Franjo Frntić and Vjenceslav Herout, *Vila Bilogorska* (Grubišno Polje: Ogranak Matice hrvatske Grubišno Polje, 1995), 34, 39–35, 43; Filip Škiljan, *Kulturno historijski spomenici Zapadne Slavonije* (Zagreb: Srpsko narodno vijeće, 2010), 183; Vjenceslav Herout, *U sjeni prošlosti: Veliki i Mali Zdenci* (Grubišno Polje: Ogranak Matice hrvatske Grubišno Polje, 2016), 9.

The site was architecturally modified and expanded through time which was well tracked in the excavated area where various building phases and reconstruction of the fort's building modifications has been recognized.<sup>8</sup> Three main horizons have been recognized each with several different phases. Both pottery and metal finds as well as radiocarbon analysis confirm such stratification and division into three main horizons. The oldest horizon is abundant with the remains of timber and woodwork preserved at great depths. These remains point to the ways of forming the first rampart and the palisade in the second half of the 13<sup>th</sup> century, which was probably supplied by the wooden platform for the patrol of the defenders. In the 14<sup>th</sup> century the finds already point to the presence of nobility at the site in a greater extent. In the second horizon (15<sup>th</sup> century) the central elevation is expanded, the palisade is repaired, and probably the fortress is further fortified by the two circles of the ditches and the ramparts in the south. The intense life of the second horizon left us numerous finds from the 15<sup>th</sup> century. Particularly remarkable is a high number of more luxurious tableware finds – cups and jugs of the local and regional production as well as the imported *majolica* finds. The quality and quantity of tableware is not inferior in no way to those found at the stone castles. This testifies to us that the owner or the owners of the fortress could afford themselves and have maintained rather high standard of life.<sup>9</sup> Archaeological research, apparently, provided evidences which go to favour of confirmation of a supposed location of the *castrum Izdench* at this position.

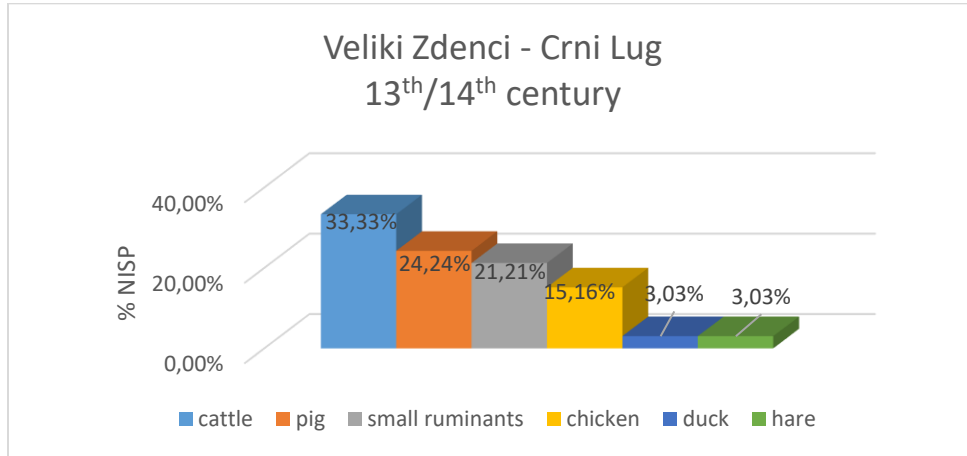
The third horizon of the fort has been represented by the upper layers and one waste pit which testify that life on the fortress maintained also in the beginning of the 16<sup>th</sup> century.

The bone remains thus deriving from different occupation phases (mostly from the layers and just in one case from a waste pit) have been analysed inside of each archaeological context, and afterwards the results have been observed in accordance to the mentioned three horizons which link all four sites in consideration. In the first horizon of Veliki Zdenci castle (13<sup>th</sup>-14<sup>th</sup> century) there were only 71 specimens from which 33 bones have been identified (46,48%), in the second horizon (end of the 14<sup>th</sup>-15<sup>th</sup> c.) 356 specimens were found out of which 39,9% was identified and in the third horizon (end of the 15<sup>th</sup> - beginning of the 16<sup>th</sup> c.) from 86 found specimens 29,07% have been identified (Tab.1).

The most represented species in all three horizons at Veliki Zdenci fort is cattle, highly represented are also pigs in all horizons, and small ruminants (sheep, goat) in the first horizon. It is interesting that in the second horizon sheep and goats are poorly represented and in the third horizon there were no evidence of them at all. But, we have to have in mind that only small trench was excavated and the sample is not large. Poultry, chicken and ducks, is represented in all horizons in slightly smaller percentage, especially in the third horizon (Fig. 3a-c).

<sup>8</sup> Tkalčec, "Arheološka istraživanja na lokalitetu Veliki Zdenci," 110, Fig. 3.

<sup>9</sup> Tkalčec, "Arheološka istraživanja na lokalitetu Veliki Zdenci," 114, Figs. 7–8.



3a Veliki Zdenci–Gradina: animal species representation (%NISP) in the 1<sup>st</sup> occupation horizon (made by Tajana Trbojević Vukičević)

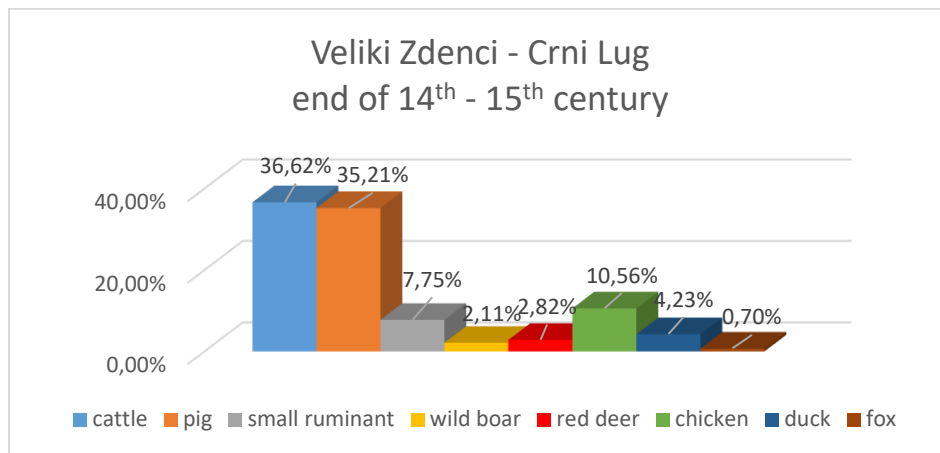


Fig. 3b Veliki Zdenci–Gradina: animal species representation (%NISP) in the 2<sup>nd</sup> occupation horizon (made by Tajana Trbojević Vukičević)

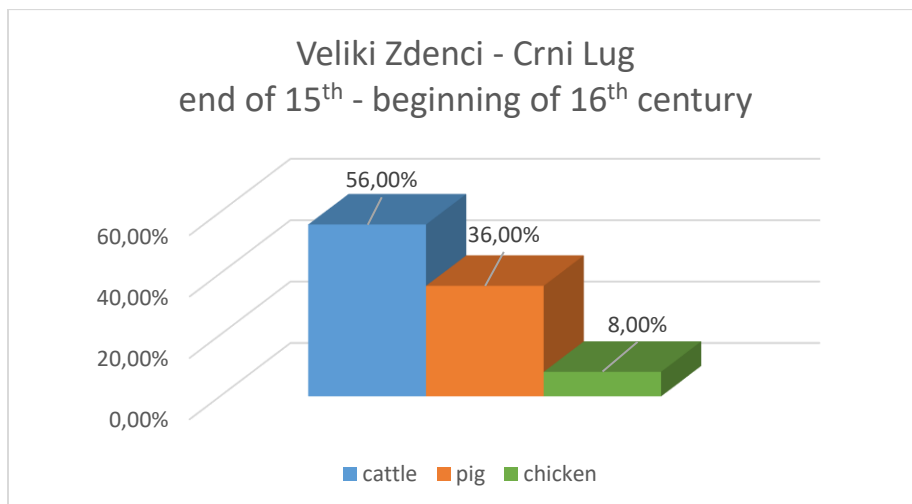


Fig. 3c Veliki Zdenci–Gradina: animal species representation (%NISP) in the 3<sup>rd</sup> occupation horizon (made by Tajana Trbojević Vukičević)



Most of the cattle specimens (at least 5 individuals) are adults older than 5 years. In the second horizon almost all determined cattle fragments also belongs to adult animals, estimated age from 2.5 – 3 years and older, while in third horizon, beside one animal younger than 2 years, all the others are from adults. The majority of adults lead us to conclusion that cattle was most probably primarily used for labour and secondary products (milk and manure). Cut marks and hacks have been recognized on the few elbow, hip and hock joint bones as the evidence of butchering. It is very likely that the front and rare limbs were first separated from the trunk (in shoulder and hip joint) and then the extremities were cut into smaller portions (elbow joint), while distal parts of the legs without meat (hock joint) probably were thrown away. Small and shallow cut marks were found on phalanges as indicator of skinning. Unlike cattle, pigs were primarily breed for meat. Estimated age on about 30 pig bones were in age of 1 to 2.5 years in all three horizons. Only in the third horizon one specimen younger than one year, and one older than 3.5 years have been found. Traces of butchering are present on several bones in all three horizons. Tooth marks found on one humerus indicates the presence of carnivores, probably dogs at the site in the second horizon, although their bone remains were not found.

In the first and second horizons age could be estimated on about half of specimens and they all belong to adults. The age of small ruminants also indicates they were most probably primarily used for secondary products like wool and milk, while few butchering marks points to nutritional purposes as well.

Hunting is confirmed by a hare bone in the first horizon and some bones of wild boar and red deer as well as one fox bone in the second horizon of the castle. Hare and particularly fox could have been used not only in nutrition purposes but also for further processing of their fur. Game was not an important source of food but its greater representation on the high status sites indicate the social class who had a permit for the hunting and the need to express their distinct identity by this activity. Inner-site comparison of domestic animals by the horizons at Veliki Zdenci shows that in all periods the cattle is highly represented. Some chronological changes in species frequencies can be recognized in ratio of cattle and pig showing the increase of pig in the second and the third horizons followed by decrease of small ruminants and their absence in the third horizon. Traces on the domestic mammal bones suggest the use of upper and lower legs with more meat of better quality than in other parts of the body. Fowl are poorly but permanently represented in all horizons, occasionally filling the menu (Fig. 4).

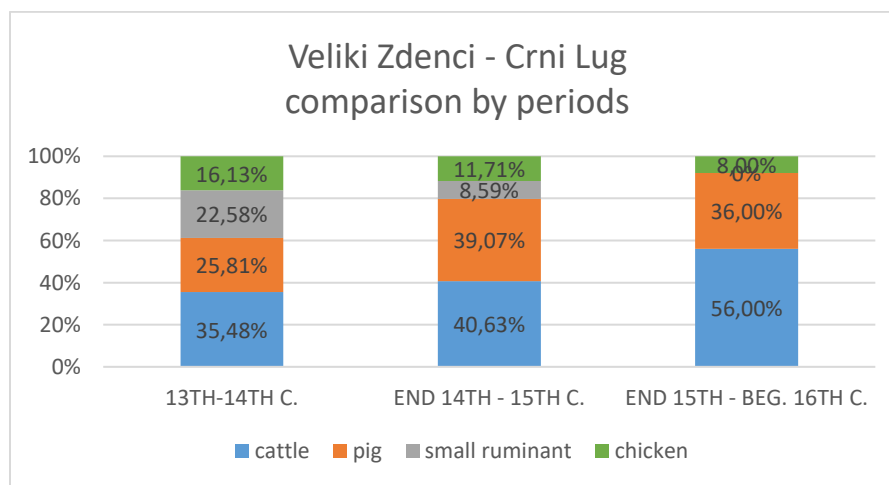


Fig. 4 Veliki Zdenci–Gradina: inner-site comparison of domestic animals (%NISP) by the horizons (made by Tajana Trbojević Vukičević)

## 2.2. Grubišno Polje–Šuma Obrovi 1

Wooden-earthen fortification named Grubišno Polje–Šuma Obrovi 1 dated to the end of the 15<sup>th</sup> and very beginning of the 16<sup>th</sup> c. is located in the forests north of the town of Grubišno Polje. In its immediate vicinity there are two other localities where the Institute of Archaeology discovered the site of church with the cemetery (Grubišno Polje–Šuma Obrovi 2, with graves dated from the 12<sup>th</sup> to the 16<sup>th</sup> century) and parts of the settlement (Grubišno Polje–Šuma Obrovi 3, dated to the 14<sup>th</sup> century).<sup>10</sup> About one kilometre east of the fort at Grubišno Polje–Šuma Obrovi 1 there is another wooden-earthen fortification – Mala Peratovica–Šuma Obrovi dated to 14<sup>th</sup>/15<sup>th</sup> century. Small trench excavated at the latter fortification gave scarce bone finds so the sample was not representative and was not taken into consideration in this research.<sup>11</sup> However, this earlier fort may perhaps be linked to archeologically excavated church/cemetery and settlement which, according to historical sources, have been raised in the former estate of Pribislav from the 13<sup>th</sup> century and according to some opinions can be linked with the village of *Cleti* and the church of St. Nicholas, mentioned in this area in the 14<sup>th</sup> and 15<sup>th</sup> centuries<sup>12</sup> although some other historians indicate the possible location of that church on the wider area around the nowadays villages Treglava and Gornja Rašenica and further to the north towards the location of the archaeological complex in Obrovi woods.<sup>13</sup> So, based on the current research, the village at the site Grubišno Polje–Šuma Obrovi 3 with the church/cemetery at the site Grubišno Polje - Šuma Obrovi 2 are still not recognized in the historical data. From an archaeological point of view, both nearby forts - Mala Peratovica–Šuma Obrovi as well as Grubišno Polje–Šuma Obrovi 1 could have been the centres of estate in which the archaeologically discovered village with church/cemetery existed, except the fort Grubišno Polje–Šuma Obrovi 1 is built later, after the one in Mala Peratovica–Šuma Obrovi has ceased to exist.

The fort Grubišno Polje–Šuma Obrovi 1 consists of three parts defended by walls and ditches and surrounding natural slopes and gorges. Nobleman's quarter was organised at the central elevation (Fig. 5).



Fig. 5 Grubišno Polje–Šuma Obrovi 1: a view to a nobleman's quarter from the north (photo by Tatjana Tkalčec)

<sup>10</sup> Tatjana Tkalčec and Siniša Krznar, "Druga sezona arheoloških istraživanja kasnosrednjovjekovnog arheološkog kompleksa Grubišno Polje – Šuma Obrovi," *Annales Instituti Archaeologici* 13 (2017): 64–72.

<sup>11</sup> Tkalčec, "Kasnosrednjovjekovni arheološki kompleks," 105, 107, 110, Figs. 17–20.

<sup>12</sup> Dujmović, "Zdenci u 13. i 14. stoljeću," 22, 24, Map; Kamilo Dočkal, "Srednjovjekovna naselja oko Dobre Kuće," *Starine JAZU* 48 (1958): 100–101; Ranko Pavleš, "Gordova i Kontovec – dva srednjovjekovna vlastelinstva na području Grubišnog Polja," *Zbornik Janković* 3 (2018): 25.

<sup>13</sup> Pavleš, "Gordova i Kontovec," 26.

Finds of bricks in layers suggest the existence of a building built in brick masonry, but no traces of its walls have been found. Stratigraphy and finds have confirmed the dating to the late 15<sup>th</sup> and perhaps very beginning of the 16<sup>th</sup> century, with no continuity from earlier times. Three trenches were excavated on this tripartite fortification – one at the eastern, the largest unit which was probably used as economic and military quarter, and the other two at the main, central unit.<sup>14</sup> Most interesting building and fortification finds were yielded in the trench opened on the north edge of the central plateau where traces of the palisade and the bridge have been found.<sup>15</sup> On the other side most interesting small finds (luxurious knife, stove-tiles, majolica jugs) which confirms the noble status of the owner have been found in the trench opened in the centre of the main unit.<sup>16</sup> The archaeozoological material originates mostly from the layers from each excavated trench and from several pits from the trench in the central area of the main unit (see Tab. 1) and the whole assemblage was observed in the frame of the third horizon, e.g. 15<sup>th</sup> and the beginning of the 16<sup>th</sup> century. From 226 found specimens 28.77% bones could have been identified. The pig is highly represented and it greatly outpaces the presence of cattle in the sample (Fig. 6).

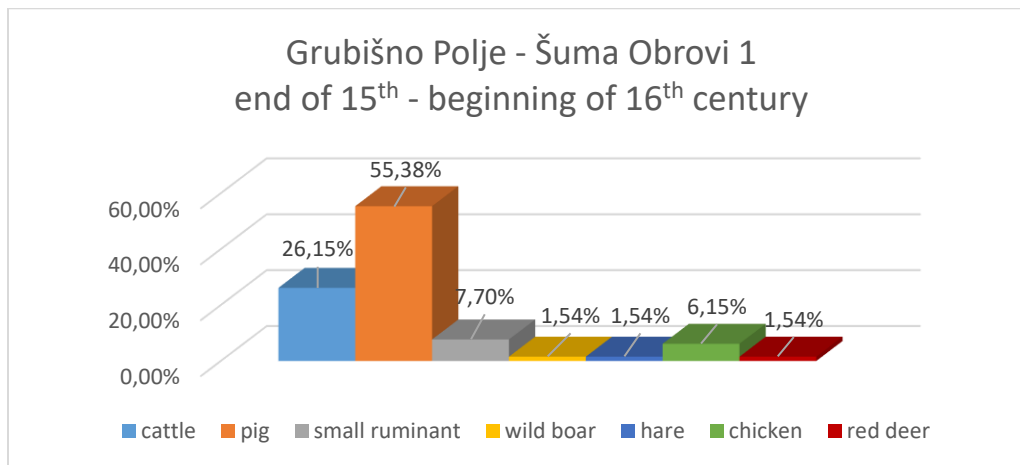


Fig. 6 Grubišno Polje–Šuma Obrovi 1: animal species representation (%NISP) (made by Tajana Trbojević Vukičević)

We can assume that in the medieval period a lot of oak woods have been surrounding the site, likewise it is today also, and such a landscape was a suitable natural environment for breeding pigs due to oak nuts as their source of food. Small ruminants in a smaller percentage as well as chickens are also present.

While most of the cattle bone specimens belong to adults, the estimated age of pigs varies over a wide range, from a few juvenile (younger than 6 months) and subadults (around 1 year) through majority of adults (older than 2 years) to quite old in age around 4-5 years. This latter age group could also be interpreted as the beginning of a more organized selection, respectively the selection of individuals of the best characteristics for further longer breeding. However, other pig age groups were primarily used for meat, which can be seen from the traces of butchering on several long bones, while the section on the occipital bone and second cervical vertebra is considered as evidence of decapitation, which could suggest the cause of death or be an integral part of the butchering process. Two small ruminant fragments are estimated as subadults, while paramedian

<sup>14</sup> Tkalčec, “Kasnosrednjovjekovni arheološki kompleks,” 101, Fig. 3.

<sup>15</sup> Tkalčec, “Kasnosrednjovjekovni arheološki kompleks,” 104, Figs. 7–8.

<sup>16</sup> Tkalčec, “Kasnosrednjovjekovni arheološki kompleks,” 107–108, Figs. 11–14.

section on cervical vertebrae could be proof of cutting trunk in halves. According to the evidence of bones of wild boar, hare and red deer the presumption that in the vicinity of the castle a lot of woods (which are natural habitat for wild animals) have been present in the medieval times is confirmed and it is obvious that the owners of the castle have been engaged in the hunting activities to some extent.

### 2.3. Sveta Ana - Gradina

Further to the north in the vicinity of town of Đurđevac, on the hill called Gradina (which in Croatian means ruined castle or old fort) 40 m above the village Saint Ana another small castle was investigated (Fig. 7).



Fig. 7 Sveta Ana–Gradina: a view from the west (photo by Tatjana Tkalčec)

The historians wonder whether this fort may be associated with the medieval *Thybonincz*, which was demolished in the late 15<sup>th</sup> century, and was probably destroyed by the Ottomans in the middle of the 16<sup>th</sup> century<sup>17</sup> or with the *Zwsyscha* castle, which, according to historical sources, has been demolished already at the end of the 14<sup>th</sup> century.<sup>18</sup> The results of archaeological research go in favour of the second thesis.

On the central elevated plateau a trial trench (10 x 1.5 m) stretching from the centre to the western edge of the prominently elevated plateau has been opened.<sup>19</sup> Two cultural horizons with regular rows of post-holes of the pillars of a wooden building and several waste pits with findings of table and kitchen ware, animal bones and some glass and metal objects have been found. The dense arrangement of post-holes and their relatively large diameters would suggest the existence of a wooden structure that could hold a more massive building, respectively, according to the findings of the table ware - the dwelling tower of the noblemen in the 13<sup>th</sup> and 14<sup>th</sup> century.<sup>20</sup> Though the stratigraphy clearly indicated the existence of two horizons,<sup>21</sup> it is interesting that the ceramic material from both horizons is very similar, and there are no ceramic types of vessels or other finds

<sup>17</sup> Zvonko Lovrenčević, „Srednjovjekovne gradine u podravskoj regiji“, *Podravski zbornik* 85 (1985): 172.

<sup>18</sup> Ranko Pavleš, *Koprivničko i đurđevačko vlastelinstvo. Povijest, topografija, organizacija* (Koprivnica: self-published, 2001), 210–213.

<sup>19</sup> Tkalčec, „Probna arheološka istraživanja“, 46, Fig. 1.

<sup>20</sup> Tkalčec, „Probna arheološka istraživanja“, 48, Fig. 3.

<sup>21</sup> Tkalčec, „Probna arheološka istraživanja“, 47, Fig. 2.

that could be dated to the 15<sup>th</sup> century.<sup>22</sup> Therefore, a complete bone sample from St. Ana is considered within the 13<sup>th</sup> / 14<sup>th</sup> century horizon. It consists of 586 specimens and 39.42% of the bones were identified (see Tab.1).

The largest number of bone fragments belongs to pigs, and high percentage of surprisingly well preserved bone remains of chickens is also present (Fig. 8).

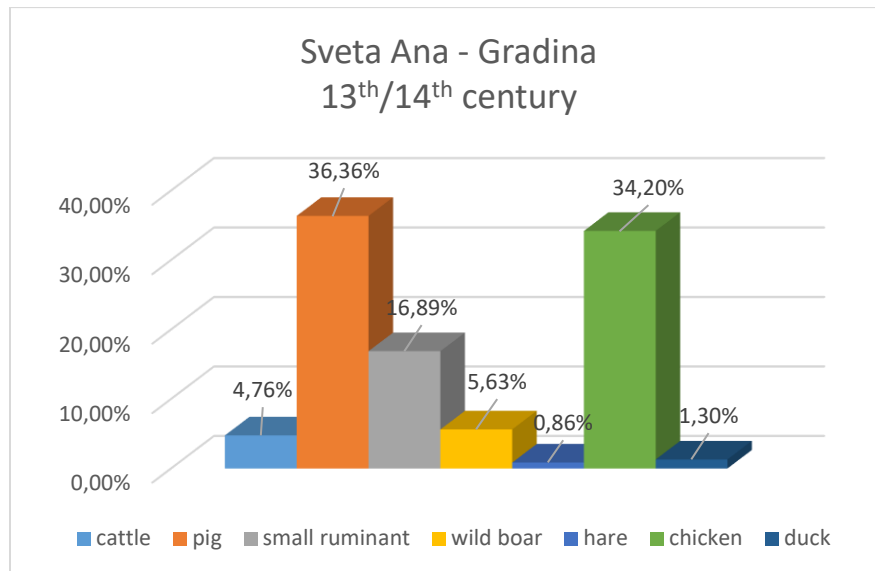


Fig. 8 Sveta Ana–Gradina: animal species representation (%NISP) (made by Tajana Trbojević Vukičević)

The estimated age of pigs shows only one specimen of quite young animal (younger than 7 weeks), and the others (about 30 specimens) not older than 4 years, most of them in the age of 1 to 2 years. Cut marks and hacks are visible on bones belonging to big joints (shoulder and hip joint) as an evidence of disarticulation of legs from the trunk as well as on hock joint bones, which could lead to conclusion that distal part of the legs (foot) were thrown. Also, median and paramedian sections on vertebrae usually points to cutting the trunk in two halves. Small cutmarks on long bones could be consequence of chopping into smaller parts, suitable for thermal treatment and/or consumption.

Large amount of poultry bones belongs to all body parts, assuming whole animals were used for alimentation. Poultry breeds rapidly, there are not much care with their breeding, and they give both eggs and meat, and feathers as well. The duck is also evident although in a rather small percentage but the sum of percentage of chickens and ducks is almost equal to the percentage of pigs.

Besides high percentage of pigs and chicken small ruminants were also quite well represented. All ages of individuals are present - 2 bones of juvenile animals (age around 6 months), 7 subadults (1-2.5 years) and 4 adults (older than 3 years). Cut marks have been found only on one shoulder blade.

The least represented domestic mammals are cattle. All ages of cattle is present – 2 juveniles younger than 1 year, 2 subadults around 1.5 year and 2 adults older than 3 years. Cut marks were found on only two unidentified long bones.

Hunting is also evidenced – wild boar in noticeable percentage of 5.63% and hare 0.86%.

<sup>22</sup> Tkalčec, “A nemesség várai ,“ 42.



## 2.4. Osijek Vojakovački – Mihalj

Further to the north in the hilly landscape of Kalnik mountain region the medieval site of Osijek Vojakovački – Mihalj is situated. It is located about 16 km north of Križevci (*Cris*), the centre of the medieval *comitatus Crisiensis*. The Institute of Archaeology carried out geophysical, archaeological and Lidar investigations which have resulted with discovering of a wooden-earthen fort, a stone church and a stone fortified house at the site.<sup>23</sup> Distance between these three localities at Mihalj site - a wooden-earthen fort, a stone church and a stone fortified house - is up to 50 meters. Though deeper trenches up to the geological layers have been excavated only at a few positions, the combination of geophysics and archaeology has enabled the definition of complete layouts of stone masonry facilities of the fortified house and the Romanesque church.<sup>24</sup>

The stone one-nave church with a semi-circular apse corresponds to a 13<sup>th</sup> century Romanesque layout, and certain finds indicate that it could last until the 15<sup>th</sup> century. The square central elevation (30 x 25 m) of the earth-and-wood fortification, dated to the end of the 14<sup>th</sup> and to the 15<sup>th</sup> century, is enclosed by a deep ditch and rampart from the north, west, and south. There is no rampart on the east side – there the fort is protected by the natural steep slopes. In archaeological excavation no animal bones have been found on the area of the church and the wooden-earthen fort, except for a few fragments of burned animal bones at the latter. The analysed bone assemblage originates from the excavations of the third position at this medieval complex – the stone fortified house. The building with elongated rectangular layout (26.5 x 10.20 m) has been preserved only in its foundations (Fig. 9).



Fig. 9 Osijek Vojakovački–Mihalj: a view from the east to the eastern room of the fortified house (photo by Tatjana Tkalčec)

<sup>23</sup> Branko Mušič et al., „Geofizička istraživanja na arheološkome nalazištu Osijek Vojakovački – Mihalj u 2017. godini,“ *Annales Instituti archaeologici* 14 (2018): 80–87; Tkalčec, „Arheološka istraživanja na srednjovjekovnome“.

<sup>24</sup> Tkalčec, „Arheološka istraživanja na srednjovjekovnome,“ 141, Fig. 2.

At the ground floor the building seems to have been divided into three rooms, and below the central room there was a cellar. The cellar may also have been divided by a wall in two spaces, or it was built just below the eastern part of the central room. The partition walls in the higher levels were probably built in brick also, which is evidenced by the ruins of bricks in the backfill layers of the cellar. In the eastern ground floor room, segments of brick flooring have been preserved. The ceramic and other finds that originate from the collapsing layers of the fortified house indicate that the building has functioned in the second half of the 13<sup>th</sup> and 14<sup>th</sup> century, which is confirmed by the C14 analysis also. There are indications of a wooden building surrounded by a defensive moat which has existed prior to the stone building as well. This earlier, wooden building might, according to the scarce ceramic finds, originate back to late 12<sup>th</sup> or the first half of the 13<sup>th</sup> century, although the radiocarbon analysis point even to the 11<sup>th</sup> and 12<sup>th</sup> century.

For now we cannot speak with certainty whether Mihalj's building – the presumed fortified house - belonged to a nobleman, a monastery, an ecclesiastical or knightly order, however thesis of the noble's manor house seems the most probable. Similar complex sites in Croatia have not been investigated so far, but some analogies are found outside the country, for example at the sites of Tynec upon Sazava, Chvojen, Vrutek, Volyne and others.<sup>25</sup> We assume that the church was dedicated to St. Michael and that its memorial was preserved in the toponym of the hill Mihalj. Historical research points to the importance of this area in the Middle Ages - it was the area of intersection of various estates of the nobility and the church and military orders. In the known historical sources there is no mention of the church of St. Michael or the castle/manor. The complex issues of scarce historical data, none of them directly mentioning the site of Mihalj, is presented in other places<sup>26</sup> and here we can point out that it seems that the complex stretched in the area of the medieval estate *Cerovo brdo* (Oak hill, referring to Turkey oak) first mentioned in 1225, unless it constituted a separate possession related to some ecclesiastical orders or monasteries outside the Zagreb Diocese and medieval Križevci County.

As already mentioned the analysed bone assemblage of the Mihalj site originates from the area of the stone fortified house, more precisely from the four smaller but deeply excavated trial trenches and from other areas where only the layout of the masonry was defined. All contexts - different occupation layers around the building and inside it as well as the backfill layers of the moat - are dated to the mid of the 13<sup>th</sup> century till around mid of the 14<sup>th</sup> century, and thus can be classified to the first horizon in our analysis.

The bone remains consist of only 85 specimens, 49.4% of it has been identified (see Tab. 1).

Cattle are highly represented with 40.48 %, than we have pigs (19.05%) and small ruminants (16.66%). Chickens are poorly represented with only one bone and one horse bone is also present. The bones of cattle belong to animals older than 3 years (age estimated on 4 specimens), the pigs (three specimens) are older than 1 year, and the small ruminants are older than 10 months (age estimated on three specimens). Butchery marks are visible only on one pig cervical vertebra (cutting trunk in halves). The relatively high percentage of frogs is not relevant since the well preserved bones, found in the smaller area of a single context, almost certainly belong to one individual.

<sup>25</sup> Antonín Hejna, „Drobná opevněná sídla v Čechách a jejich místo v sídlištním vývoji 10.-13. století,“ *Archaeologia historica* 3 (1978): 75–83.

<sup>26</sup> Tatjana Tkalčec, „Vojakovački Osijek–Mihalj – srednjovjekovni arheološki kompleks na gornjem toku Glogovnice,“ *Prilozi Instituta za arheologiju u Zagrebu* 24 (2007): 453–472; Ranko Pavleš, „Apatovec, Cerovo brdo i neki susjedni posjedi u srednjem vijeku,“ *Cris: časopis Povijesnog društva Križevci* 6, no. 1 (2004): 35–46.

During the cold and dry days of the year frogs like to burry themselves in the sludge and this frog may had seek protection in mood and dyed there in medieval, postmediaeval or even more recent times also (Fig. 10).

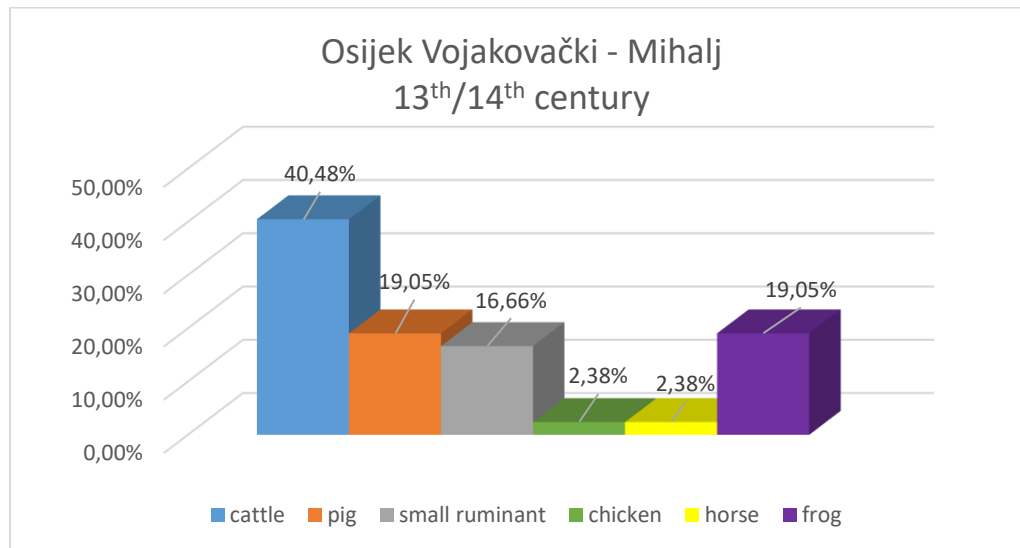


Fig. 10 Osijek Vojakovački–Mihalj: animal species representation (% NISP) (made by Tajana Trbojević Vukičević)

### 3. Discussion

“Alimentation was, and is always, a social act with strongly ritualised and normative connotations”.<sup>27</sup> Although larger faunal samples are more accurate and samples under 500 remains give only some indications<sup>28</sup> our aim was to examine the available faunal assemblage from the four sites of the Slavonian elite (lower and middle nobility) and try to realize if the animals in alimentation of the castle inhabitants have any role of identifiers of the social status of the sites in case, respectively social standing of the castles’ owners and inhabitants.

The more common zooarchaeological criteria for the differentiation of consumption habits and distinct uses of animals for non-food purposes of the elite and lower-status persons, respectively settlements, are thoroughly demonstrated in extensive zooarchaeological study on complex societies of the Americas before the European colonisation by Susan D. deFrance. The recognisable indicators of social disparity of the elite consumption are: more meat, better cuts, meaty portions (forelimb or hindlimb), greater diversity/variety of animals than non-elites, younger animals, especially domesticates, greater use of domestic animals than non-elites, greater use of larger domesticates, use of nonindigenous domesticates, deer and pig as high-status animals, greater use of hunted wild animals than non-elites, exclusive use of rare or exotic wild animals, rare, imported animals, management of wild animals, animals (food) that involve much preparation and

<sup>27</sup> Thomas Kühnreber, “Alimentation and meat at medieval castles: social practice and economic structures from the archaeologist’s perspective”, in *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, eds. Günther Karl Kunst and Matthias Kucera (Wien: Vienna Institute for Archaeological Science, 2010), 66.

<sup>28</sup> Alfredo Riedel, *The animal remains of the medieval Verona: an archaeozoological and palaeoeconomical study*. (Verona: Museo civico di storia natural di Verona, 1994), 12.



processing, little butchering waste (e.g. crania, feet), crania as high-value portion, meat wastage, efficient butchering methods, less bone tool debitage, ornamental bone object manufacture, use of fat, greasy flesh foods, larger fish, imported fish, marine products, preferred fish, larger shellfish, more shellfish, greater use of birds, especially wild birds.<sup>29</sup> All these indicators can vary significantly depending on geographically and environmental/climatic conditioned factors, regional availability, nature of the deposition, cultural preferences of the community, human requirements, etc. and ultimately the results are conditioned also by the preservation of bones, recovery procedures, analytical techniques etc.<sup>30</sup>

Variety of individual case studies and few synthetic analysis in Hungary, Switzerland, Austria and other Middle-European countries point out that in spite of different obstacles and confounding factors in approaching the zooarchaeological analyses some representative conclusions can be drawn<sup>31</sup> and it is of most importance to continue to publish the data and acquired knowledge in order of advancing the subject and better understanding of these issues of past societies.<sup>32</sup>

Summarizing the detected patterns of species ranges at elite-sites it should be pointed out that for high-status settlements more intensive consumption of wild animals, pigs and chickens is typical while for the socially not privileged population higher shares of bones of older cattle, sheep and goats as well as bones of horses and dogs in the food waste are recognized.<sup>33</sup> There is also a chronological distinction in beef consumption patterns. Nobles are using cattle in alimentation purposes in lesser extent from the early middle ages to the late middle ages, but at the turn to the Modern period the proportion of cattle consumption increases, and the consumption of pig decreases.<sup>34</sup> Consumption of more pig, especially piglet and less beef (but more young cattle) as characteristics of the alimentation habits of the medieval elite is recognized on plenty of sites,<sup>35</sup> but there are still castles with dominant quantities of cattle and goat/sheep. These distinctions can indicate differences in the level of prosperity of the high-status settlement, but they can also indicate specifics of the regional environment and human requirements. For example at Austrian high- and late medieval castles of middle and lower nobility cattle prevail and the wild animals are also underrepresented.<sup>36</sup> Many high-status medieval sites in England also contain a high proportion

<sup>29</sup> Susan D. deFrance, "Zooarchaeology in Complex Societies: Political Economy, Status, and Ideology," *Journal of Archaeological Research* 17, no. 2 (2009): 124–125, Table 1.

<sup>30</sup> Steven P. Ashby, "The role of zooarchaeology in the interpretation of socioeconomic status: a discussion with reference to Medieval Europe," *Archaeological Review from Cambridge* 18 (2002): 45, 49; Erika Gál, "Animal remains from archaeological excavations in North-Eastern Hungary," in *Environmental Archaeology in North-Eastern Hungary*. eds. Erika Gál, Imola Juhász and Pál Sümegi, (Budapest: Instituti Archaeologici Academiae Scientiarum Hungaricae, 2005), 159; Bartosiewicz, "Animal husbandry," 143.

<sup>31</sup> Bartosiewicz, "Animal husbandry;" Gál, "Animal remains;" Heidemarie Hüster-Plogmann et al., "Mittelalterliche Ernährungswirtschaft, Haustierhaltung und Jagd. Eine archäozoologische Untersuchung ausgewählter Fundensembles aus der Schweiz und dem angrenzenden Ausland," *Beiträge zur Mittelalterarchäologie in Österreich* 15 (1999): 223–240; Sigrid Czeika, "Tierknochenfunde auf österreichischen Burgen. Möglichkeiten und Grenzen ihrer bisherigen Interpretation," *Beiträge zur Mittelalterarchäologie in Österreich* 15 (1999): 177–186. For other here not used middle-European recent literature see in Kühnreiter, "Alimentation and meat at medieval castles," 66. The individual case studies are numerous and few are used and cited at other places in this text.

<sup>32</sup> Ashby, "The role of zooarchaeology," 52.

<sup>33</sup> Hüster-Plogmann et al., "Mittelalterliche Ernährungswirtschaft," 230.

<sup>34</sup> Hüster-Plogmann et al., "Mittelalterliche Ernährungswirtschaft," 234.

<sup>35</sup> Bartosiewicz, "Animal husbandry," 144–145.

<sup>36</sup> Czeika, "Tierknochenfunde auf österreichischen Burgen," 182. For German area where pigs are common food in alimentation some high-status castles also show underrepresented portion of wild animals. For example, at the Oberrusel-Bommersheim castle, dated from 11<sup>th</sup> till 14<sup>th</sup> century (but more than 95% of faunal material originates from the contexts dated to 14<sup>th</sup> century) domesticated animals were represented in percentage of 95,7% (mammals 84% and poultry 14%) and wild animals 1,3% (wild mammals 0,8%). Pigs make 50.5%, cattle 25% and small ruminants 8,9%

of pig, deer and birds, however, it is pointed out that the domestic birds are perhaps not best indicator of status because breeding the chickens, geese and ducks, which provides eggs as well as meat, is relatively unexpansive and could easily have been raised by peasants also.<sup>37</sup>

Hunting is generally seen as the prerogative of the elite, regulated by permits, especially in the case of large game.<sup>38</sup> Comparing the number of identifiable specimens of wild animals from Hungarian sites the clear differences between rural (1.57% wild NISP), urban (0.93% wild NISP) and high status (5.25% wild NISP) settlements type have been recognized.<sup>39</sup> Observing the wider European area the percentage of game at castles oscillates between 2 to 5% with maximum 11%.<sup>40</sup> The relationship of hunting to status is most often, but not always, correlated positively. Significant proportion of game bones at non-high status sites may indicate to poaching rather than high socio-economic standing,<sup>41</sup> or some special relationship between the estate owner and his rural subordinates, but surely it indicates the environmental specifics of the landscape.

In our study the nutrition habits, based on meat alimentation of inhabitants of four small castles are compared to each other, and the obtained results are also compared with other chronologically simultaneous high-status sites and non-elite sites, e.g. castles and rural settlements in closer and distant regions of Mediaeval Slavonia in order to observe the dietary habits of the inhabitants of the selected sites in a wider context.

### 3.1. Inter-site comparison of faunal assemblages

In this inter-site comparative review the focus is put on the range of species of domesticated animals which are mostly represented by mammals like pigs, cattle and small ruminants and poultry. In the case of the latter chickens are well represented while ducks are present at Sveta Ana and in first two horizons of Veliki Zdenci in so small percentage that they were taken out of comparative observations. The same is for one horse bone found only at Mihalj. In case of mammals, besides the range of domestic species the quality of meat interpreted by skeletal representation and the age of slaughter of the animals is taken into consideration as well as representation of wild animals as indicators of social distinction. The non-alimentation animals like chance finds of frog bones in a context from the Osijek Vojakovački–Mihalj site were not taken into observation.

---

of domesticated mammals, and some fish, horse, dog and cat bones were also found (Friedrich et al., „Die hochmittelalterliche Motte und Ringmauerburg von Oberrusel-Bommersheim, Hochtaunuskreis: Vorbericht der Ausgrabungen 1988-1991,“ *Germania* 71, no. 2 (1993), 510, Tab. 1).

<sup>37</sup> Ashby, „The role of zooarchaeology,“ 52.

<sup>38</sup> Bartosiewicz, „Animal husbandry,“ 142.

<sup>39</sup> Bartosiewicz et al., „The beast in the feast,“ 93–94, Fig. 8.

<sup>40</sup> Kühnreiter, „Alimentation and meat at medieval castles,“ 69.

<sup>41</sup> Ashby, „The role of zooarchaeology,“ 42.

Inter-site comparison of dietary habits and use of animals in other purposes beside the meat for food in different periods, namely in specific horizons of individual studied sites on the bone remains of cattle, pig, small ruminants and chicken could be made for only two horizons – the earliest and the latest (Fig. 11-12).

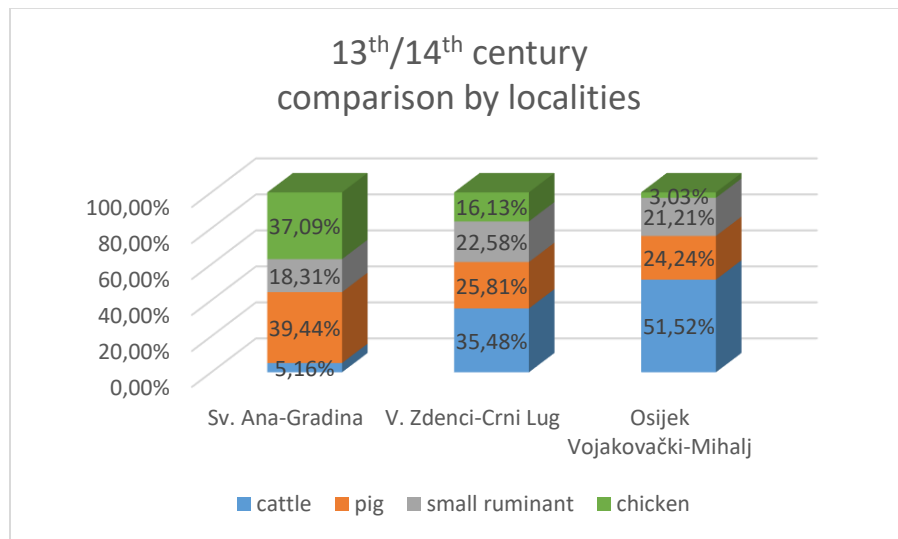


Fig. 11 Inter-site comparison of domesticated animals' representation (%NISP) in the period of the 13<sup>th</sup>/14<sup>th</sup> century (made by Tajana Trbojević Vukičević)

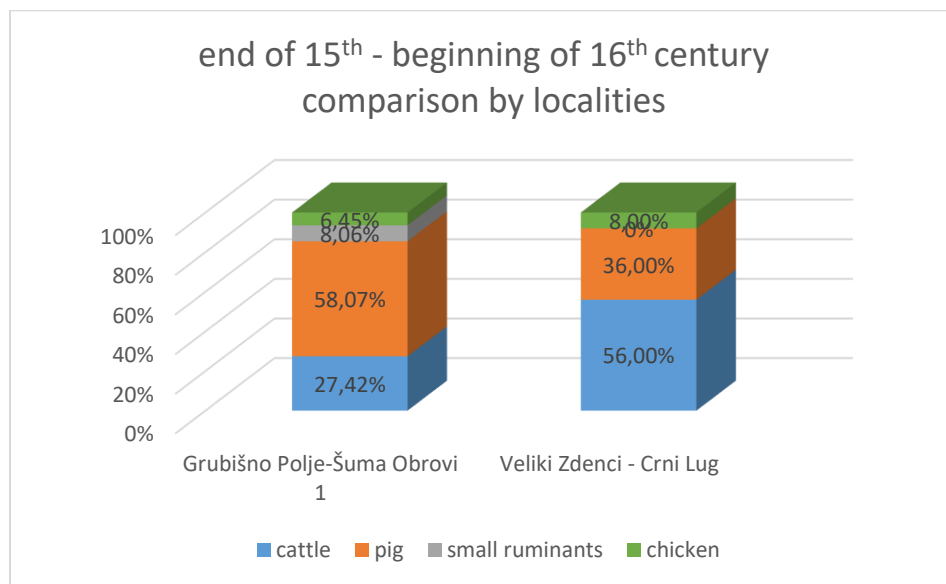


Fig. 12 Inter-site comparison of domesticated animals' representation (%NISP) in the period of the end of 15<sup>th</sup> till beginning of 16<sup>th</sup> century (made by Tajana Trbojević Vukičević)

The second horizon – end of 14<sup>th</sup> and the 15<sup>th</sup> century is richly represented at Veliki Zdenci site and poorly at Osijek Vojakovački-Mihalj at the earthen-wooden fortification, but at Mihalj only few burned bones have been found which could not be identified.

In the first horizon (13<sup>th</sup>/14<sup>th</sup> century) we could compare the results of representation of domesticated animals between three sites. Cattle dominate (51.52%) at Mihalj, in Veliki Zdenci cattle represent one third of the total sample (35.48%) of domesticated animals while in Sveta Ana they are the least represented species (5.16%). On the other side at Sveta Ana pigs prevail with 39.44% and chickens follow with high percentage of 37.09%. Pigs are second best represented domestic species at Veliki Zdenci (25.81%) and Mihalj (24.24%), narrowly followed by small ruminants (Zdenci – 22.58% and Mihalj – 21.21%). Small ruminants are on the third place of domestic species with around 20% at each site. Chickens are on the fourth place with 16.13% at Zdenci and with poorly percentage of 3.03% at Mihalj but at Sveta Ana they are highly represented domestic species at second place right behind pigs (Fig. 11).

Wild species are best represented by wild boar followed by hare which together make 6,49 percentage of all species in Sveta Ana (Fig. 8). In Zdenci we have just one bone of hare (Fig. 3a) and in Mihalj there are no wild animals.

Sveta Ana stands out not only with the distribution of the range of the species but with their age also. It is obvious that the castle inhabitants were using mostly exclusively young pork and piglet meat accompanied with chickens in their nutrition which is typical for medieval sites of wealthy people (Rehazek, Marti Gradel 2010: 63). Also in the case of under-represented sheep/goat and especially cattle, these are all animals slaughtered at a younger age. This clearly indicates that only the finest meat was served at the table of the Sveta Ana's nobility. The noble status of the inhabitants of the Sveta Ana castle is also confirmed with high percentage of wild animals (6,49%) which even outpaces the average percentage of game at some other castles of higher-status nobility. At Veliki Zdenci and Mihalj sites we do not have indications on the elite status of the sites in the first horizon which is surely greatly conditioned by the fact that the bone samples, e.g. identified bone assemblages were extremely small for these two sites. However, presence of mostly older animals (except for small ruminants at Mihalj), especially in case of highly represented cattle, as well as presence of a horse bone at Mihalj, points to inhabitants who consumed the meat of animals which were primarily used for other purposes (milk, cheese, wool, working activities etc.). It is interesting to highlight a striking fact in fundus of small finds from Mihalj also. Namely, not a piece of a metal object was found in the excavations, and the tableware shows also more modest repertoire of local production which is in contradiction with the building structures – of all sites, only at Mihalj we have firm stone masonry.

The noble status of Zdenci castle according to meat alimentation and hunting activities comes to light first in the second horizon by the presence of high 5.63 percentage of wild animals in the total bone sample, which is also clearly manifested in the stratigraphy and the other small finds from the layers of the 15<sup>th</sup> century (Fig. 3b). Furthermore, in the second and third horizon of Zdenci increase of pigs and decrease of small ruminants consumption is noticeable where, especially in 15<sup>th</sup> century, pigs are almost equally represented as cattle while the small ruminants are surpassed by the poultry and in the beginning of 16<sup>th</sup> century the small ruminants are completely absent in the bone sample (Fig. 4). As an interesting observation, it should be noted that ducks appear only at sites where faunal assemblages more clearly indicate high status such as at Sveta Ana and in the first two horizons at Veliki Zdenci.

For the third horizon (late 15<sup>th</sup> and beginning of the 16<sup>th</sup> century) we could compare Veliki Zdenci with Grubišno Polje (Fig. 12). Pigs prevail in Grubišno Polje, while in Zdenci, as said, they are surpassed by cattle. Poultry at both sites and small ruminants at Grubišno Polje just fill up the menu while game is represented in Grubišno Polje by percentage of 4.62% of bones in total bone sample (Fig. 6). This picture surely could have been influenced by small samples of available bones, especially for Zdenci, and it could indicate the ecological environment of oak forests around

Grubišno Polje castle suitable for pig breeding and hunting activities but it can also indicate the difference between the quality and status of life at Grubišno Polje and Zdenci on the other hand, the latter being in an unquestionable decline in relation to the previous horizon.

Summarizing this inter-site comparison it is obvious that in the first horizon Sveta Ana greatly differs from other sites, showing through faunal finds clear characteristics of a site of high-status inhabitants. Mihalj, on the other side, shows more indications of a non-elite site. Similarly Veliki Zdenci in the first horizon does not show faunal indicators of elite site, which is clearly changed in the second horizon when some clear indications of elite consumption can be recognized. In the third horizon the decline of prosperity of life in Zdenci is evident, while at Grubišno Polje the elite consumption habits can be recognized in several aspects.

As already noted the archaeological excavations were of small scope and the available bone samples from all studied sites are rather small and therefore may not be fully representative material for comprehensive considerations of the topic. The choice of positioning the archaeological trenches as well as the hygienic habits of medieval inhabitants could have also influenced the results of the analysis. However, the results of bone remains analyses, at the current state of investigation of the sites, match up quite well with the knowledge of the character and social status of sites derived from other archaeological data. Such cognition has encouraged us to comparison of our four sites with other contemporary Slavonian sites in terms of finds of animal bone residues as indicators of nutritional and consequently social quality of life.

### 3.2. Comparison of faunal assemblages from studied sites with other castles and settlements in Medieval Slavonia

The summarized results of archaeozoological analysis of the studied four castles are compared to the results of the archaeozoological analyses of archaeologically investigated and published high status sites such as Vrbovec,<sup>42</sup> Cesargrad<sup>43</sup> and Barilović<sup>44</sup> castles in western parts of medieval Slavonia, Čanjevo castle,<sup>45</sup> Gorbonok<sup>46</sup> and Torčec–Gradić<sup>47</sup> small castles in the *comitatus Crisiensis*, as well as Virovitica castle<sup>48</sup> in the central part of medieval Slavonia and, in addition,

<sup>42</sup> Tajana Trbojević Vukičević, Silvia Frančić and Snježana Kužir, Analiza životinjskih kostiju iz srednjovjekovnog burga Vrbovca u Klenovcu Humskome,” in Tatjana Tkalčec, *Burg Vrbovec u Klenovcu Humskome: deset sezona arheoloških istraživanja* (Gornja Stubica, Zagreb: Muzeji Hrvatskog zagorja, Institut za arheologiju, 2010), 234–246.

<sup>43</sup> Andrej Janeš, „Burg Cesargrad: povijesno-arheološka analiza,” *Portal: godišnjak Hrvatskoga restauratorskog zavoda* 5 (2014): 44–45.

<sup>44</sup> Tajana Trbojević Vukičević and Agata Kučko, „Procjena prehrambenih navika temeljem arheozoološke analize,” in *Stari grad Barilović: deset godina arheoloških istraživanja*, eds. Ana Azinović Bebek and Marijana Krmpotić (Zagreb: Hrvatski restauratorski zavod, 2014), 110–117.

<sup>45</sup> Tajana Trbojević Vukičević and Ana Štilinović, „Arheozoološka analiza kostiju s utvrde Čanjevo / Archaeozoological analysis of bones from fort Čanjevo,” in *Utvrdna Čanjevo: istraživanja 2003-2007 / Fort Čanjevo: researches 2003-2007*, ed. Luka Bekić (Visoko, Zagreb: Općina Visoko, Hrvatski restauratorski zavod, 2008), 253–259.

<sup>46</sup> Robert Čimin, *Vlastelinstvo Gorbonok* (Koprivnica: Muzej grada Koprivnice, 2017), 37.

<sup>47</sup> Snježana Kužir and Tajana Trbojević Vukičević, „Životinjski nalazi s arheološkog lokaliteta Torčec - Gradić,” *Podravina: časopis za multidisciplinarna istraživanja* 3, no. 6 (2004): 117–121. The site is dated from 13<sup>th</sup> to 16<sup>th</sup> c. but analyzed bones originates from the phases IV and V, e.g. end of 14<sup>th</sup> till 16<sup>th</sup> c. (Tajana Sekelj Ivančan and Tatjana Tkalčec, Arheološko nalazište Torčec – Gradić, *Podravina: časopis za multidisciplinarna istraživanja* 3, no. 6 (2004): 77–80).

<sup>48</sup> Tajana Trbojević Vukičević and Ivan Alić, „Arheozoološka analiza (Gradski park Virovitica; drveni piloti mosta),” in *Srednjovjekovna nizinska utvrda u Virovitici: osvrt na arheološka istraživanja*, ed. Mihaela Kulej (Virovitica: Gradski muzej Virovitica, 2008): 39–44.

the results of published non-elite sites, e.g. rural settlements in Beketinci–Bentež,<sup>49</sup> Kobilic 1,<sup>50</sup> Mekiš–Zgruti,<sup>51</sup> Stari Perkovci–Sela,<sup>52</sup> Torčec–Rudičevo<sup>53</sup> (for the distribution of the comparative sites see Fig. 1) were also taken into consideration in order to gain insight into meat dietary on different sites of the wider medieval Slavonian territory (Tab. 2).

	Elite sites (castles, forts)	century	NISP no.	pig %	cattle %	small ruminants %	poultry%	game %	fish %	other %
1	Veliki Zdenci-Crni Lug	13/14	33	24,2 4	33,33	21,21	18,19	3,03	/	/
1	Veliki Zdenci-Crni Lug	14/15	137	35,2 1	36,62	7,75	14,79	5,63	/	/
1	Veliki Zdenci-CrniLug	15/16	25	36,0 0	56,00	/	8,00	/	/	/
2	Grubišno Polje-Šuma Obrovi 1	15/16	65	55,3 8	26,15	6,15	7,70	4,62	/	/
3	Sveta Ana-Gradina	13/14	231	36,3 6	4,76	16,89	35,50	6,49	/	/
4	Osijek Vojakovački-Mihalj	13/14	42	19,0 5	40,48	16,66	2,38	/	/	21,43
5	Barilović Castle	15-16	2791	12,6 1	56,90	17,88	2,76	6,20	0,07	3,58
6	Cesargrad Castle	13-16	271	28,0 4	45,39	2,58	16,61	5,91	0,73	0,74
7	Čanjevo Castle	15-18	1478	34,6 4	36,94	6,16	10,22	7,64	0,34	4,06
8	Klenovec Humski-Vrbovec Castle	12	32	68,7 5	9,37	18,75	/	3,13	/	/
8	Klenovec Humski-Vrbovec Castle	13	296	47,2 9	14,53	13,86	20,27	3,04	1,01	/
8	Klenovec Humski-Vrbovec Castle	14/15	52	59,6 1	21,15	11,54	/	7,70	/	/
8	Klenovec Humski-Vrbovec Castle	2/2 15	278	13,6 7	6,47	44,96	25,54	2,87	3,96	2,53
8	Klenovec Humski-Vrbovec Castle	15/16	813	38,7 5	28,66	10,33	9,72	9,72	0,25	2,57
8	Klenovec Humski-Vrbovec Castle	1/2 16	176	21,0 2	44,88	16,48	3,98	8,52	/	5,12
9	Kloštar Podravski-Gorbonok	14-16	833	40,7 0	45,14	2,52	3,00	8,64	/	/
10	Torčec-Gradić	end 14- 1/2 16	164	40,2 5	41,47	7,32	7,92	2,44	/	0,60
11	Virovitica Castle	15-16	108	7,40	79,63	5,55	1,86	3,70	/	1,86

<sup>49</sup> Tajana Trbojević Vukičević, „Arheozoološka analiza kasnosrednjovjekovnoga naselja / Archaeozoological analysis of the Late Medieval settlement,” in Kornelija Minichreiter and Zorko Marković, *Beketinci Bentež: naselja iz eneolitika, ranoga i kasnoga srednjeg vijeka / Beketinci Bentež: Eneolithic, Early Medieval and Late Medieval settlements*, (Zagreb: Institut za arheologiju, 2013), 364–373.

<sup>50</sup> Nikolina Antonić and Kyra Lyublyanovics, „Prilog proučavanju gospodarstva i prehrambenih navika u Turopolju u 13. stoljeću – životinjski ostaci s nalazišta Kobilic 1,” *Zbornik Odsjeka za povijesne znanosti Zavoda za povijesne i društvene znanosti HAZU* 34 (2016): 30–31.

<sup>51</sup> Čimin, *Vlastelinstvo Gorbonok*, 36.

<sup>52</sup> Andrej Janeš, Ivana Hirschler Marić and Ana Azinović Bebek, „Stari Perkovci-Sela, ruralno naselje 14. stoljeća,” in *Srednjovjekovna naselja u svjetlu arheoloških izvora / Medieval settlements in the light of archaeological sources*, eds. Tajana Sekelj Ivančan et al. (Zagreb: Institut za arheologiju, 2017), 357–358.

<sup>53</sup> Snježana Kužir, Tajana Trbojević Vukičević and Marko Poletto, „Životinjski ostaci sa srednjovjekovnih nalazišta u okolici Torčeca,” in Tajana Sekelj Ivančan *Podravina u ranom srednjem vijeku: rezultati arheoloških istraživanja ranosrednjovjekovnih nalazišta u Torčecu*, (Zagreb: Institut za arheologiju, 2010): 369–370.



Non-elite sites (rural settlements)		century	identified bones number	pig %	cattle %	small ruminants %	chicken %	game %	fish %	other %
12	Beketinci-Bentež	14-1/2 16	1485	46,8 6	20,40	19,26	6,74	/	/	6,74
13	Kobilić 1	13	217	34,1 0	25,81	29,95	2,76	3,68	/	3,68
14	Mekiš-Zgruti	12-15	331	52,5 7	22,36	6,65	6,94	8,46	1,51	1,51
15	Stari Perkovci-Sela	14	1973	30,8 2	37,20	6,74	9,23	2,38	0,21	13,42
16	Torčec-Rudičevo	13/14	93	38,7 1	6,46	6,46	12,90	15,05	3,22	17,20

Table 2 Faunal assemblages from Slavonian medieval elite- and non-elite sites

In respect of one of the archaeozoological indicators for higher quality of life the number of specimens' percentage of wild animals is rather high at all observed elite sites. Exceptions are more obvious in the first horizon, e.g. in the early stages of the Vrbovec castle, Osijek Vojakovački–Mihalj and Veliki Zdenci–Crni Lug. Torčec–Gradić and Virovitica castle in the second and third horizon have rather low percentage of wild animal. Virovitica castle stands out with extremely low representation of pig in favour of cattle also. At Vrbovec castle pig is well represented even in its early stages as well as in later periods, although the "ideal" indicating proportion of pig-cattle-poultry-game is not recorded in neither horizon. Similar results are noticed at the other castles – Barilović, Čanjevo, Cesargrad and Gorbonok which takes us to the conclusion that Sveta Ana–Gradina is the only site approaching to the "ideal" proportion of highly represented pig and game as well as rather high represented poultry.

Non-elite sites show even more inconsistencies and deviations. Game is extremely highly represented at Torčec–Rudičevo and at Mekiš–Zgruti it also exceeds average castle game representation. Representation ratio of pigs and cattle shows that pig is the most highly represented animal at all rural settlements with exception at Stari Perkovci–Sela. It seems that testing of the thesis of the ideal proportion of animal species representation for elite and non-elite sites has failed at the Slavonian medieval sites. However, one have to take in consideration the uneven input data (for some sites animal assemblages are not analysed by more detailed periods, or we do not have data on the age of the animal nor on the body parts of the animals used for consumption) which does not provide in-depth analysis, as well as the fact that rather low number of identified specimens is identified at the most of the sites.

#### 4. Conclusion

Comparing the number of identified specimens of wild animals from Slavonian sites the clear differences between rural (1.57% wild NISP) and high status (5.25% wild NISP) settlements type as it was established for Hungarian sites<sup>54</sup> have not been recognized. Slavonian castles fit better to the picture of wider European area where the percentage of game at castles oscillates between 2 to 5% with maximum 11%.<sup>55</sup> Significant representation of game at rural settlements in Beketinci–Bentež, Mekiš–Zgruti, Stari Perkovci–Sela and especially Torčec–Rudičevo may indicate to poaching or perhaps to special status of peasants towards the estates owners. However, it clearly indicates the environmental specifics of the landscapes. Landscape richly covered by forests is indicated also with highly represented pig at rural settlements. Due to inconsistent and missing published data in this study the data on the age of the slaughtered animal and the body part of the animal used for consumption for the comparative elite and non-elite sites is not observed. Further investigation, both intensified archaeological and archaeozoological investigations which would also result with larger animal assemblage is needed to obtain more accurate knowledge on meat dietary on Slavonian medieval sites. Although the animal bone assemblages from the four studied castles is rather small, the elite-sites pattern of species ranges followed by the young age of the slaughtered animals is clearly detected at Sveta Ana–Gradina as well as in several aspects at Veliki Zdenci–Crni Lug in its second occupation horizon, while Osijek Vojakovački–Mihalj and Grubišno Polje–Šuma Obrovi 1 show weak indications of the elite-sites archaeozoological pattern. Aware of all the shortcomings of generalization on small samples, we hope that we have succeeded to highlight the great potential of archaeozoological analysis at the Slavonian medieval sites and the need for further research.

---

<sup>54</sup> Bartosiewicz et al., „The beast in the feast,” 93–94, Fig. 8.

<sup>55</sup> Kühnreiter, “Alimentation and meat at medieval castles,” 69.



## References

- Antonić, Nikolina and Kyra Lyublyanovics. „Prilog proučavanju gospodarstva i prehrambenih navika u Turopolju u 13. stoljeću – životinjski ostaci s nalazišta Kobilić 1.” *Zbornik Odsjeka za povijesne znanosti Zavoda za povijesne i društvene znanosti HAZU* 34 (2016): 21–37.
- Ashby, Steven P. “The role of zooarchaeology in the interpretation of socioeconomic status: a discussion with reference to Medieval Europe.” *Archaeological Review from Cambridge* 18 (2002): 37–59.
- Bartosiewicz, László. „Animal husbandry and medieval settlement in Hungary. A Review.” *Beiträge zur Mittelalterarchäologie in Österreich* 15 (1999): 139–155.
- Bartosiewicz, László, Alexandra Gyetvai and Hans-Christian Küchelmann. „The beast in the feast.” In *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, edited by Günther Karl Kunst and Matthias Kucera, 85–96. Wien: Vienna Institute for Archaeological Science, 2010.
- Czeika, Sigrid. „Tierknochenfunde auf österreichischen Burgen. Möglichkeiten und Grenzen ihrer bisherigen Interpretation.” *Beiträge zur Mittelalterarchäologie in Österreich* 15 (1999): 177–186.
- Čimin, Robert. *Vlastelinstvo Gorbonok*. Koprivnica: Muzej grada Koprivnice, 2017.
- deFrance, Susan D. “Zooarchaeology in Complex Societies: Political Economy, Status, and Ideology.” *Journal of Archaeological Research* 17, no. 2 (2009): 105–168.
- De Venuto, Giovanni. “To eat and to be in medieval southern Italy: the zooarchaeological contribution from religious, rural and fortified sites.” In *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, edited by Günther Karl Kunst and Matthias Kucera, 55–61. Wien: Vienna Institute for Archaeological Science, 2010.
- Dočkal, Kamilo. „Srednjovjekovna naselja oko Dobre Kuće.” *Starine JAZU* 48 (1958): 85–167.
- Dujmović, Danko. “Zdenci u 13. i 14. stoljeću – prilog poznavanju kulturnog krajolika.” *Scrinia Slavonica* 18 (2018): 11–27.
- Friedrich, Reinhard, Harro Junk, Angela Kreuz, Jörg Petrasch, Karl-Friedrich Rittershofer, Peter Titzmann und Christina von Waldstein. „Die hochmittelalterliche Motte und Ringmauerburg von Oberrusel-Bommersheim, Hochtaunuskreis: Vorbericht der Ausgrabungen 1988-1991.” *Germania* 71, no. 2 (1993), 441–519.
- Frntić, Franjo and Vjenceslav Herout. *Vila Bilogorska*. Grubišno Polje: Ogranak Matice hrvatske Grubišno Polje, 1995.
- Gál, Erika. „Animal remains from archaeological excavations in North-Eastern Hungary.” In *Environmental Archaeology in North-Eastern Hungary*. edited by Erika Gál, Imola Juhász and Pál Sűmegi, (Varia Archaeologica Hungarica XIX), Budapest: Instituti Archaeologici Academiae Scientiarum Hungaricae, 2005.
- Hejna, Antonín. „Drobná opevněná sídla v Čechách a jejich místo v sídlištním vývoji 10.-13. století.” *Archaeologia historica* 3 (1978): 75–83.

Herout, Vjenceslav. *U sjeni prošlosti: Veliki i Mali Zdenci*. Grubišno Polje: Ogranak Matice hrvatske Grubišno Polje, 2016.

Hüster-Plogmann, Heidemarie, Paul Jordan, André Rehazek, Jörg Schibler and Marcel Veszeli. „Mittelalterliche Ernährungswirtschaft, Haustierhaltung und Jagd. Eine archäozoologische Untersuchung ausgewählter Fundensembles aus der Schweiz und dem angrenzenden Ausland.“ *Beiträge zur Mittelalterarchäologie in Österreich* 15 (1999): 223–240.

Janeš, Andrej. „Burg Cesargrad: povijesno-arheološka analiza.“ *Portal: godišnjak Hrvatskoga restauratorskog zavoda* 5 (2014): 35–48.

Janeš, Andrej, Ivana Hirschler Marić and Ana Azinović Bebek. „Stari Perkovci-Sela, ruralno naselje 14. stoljeća,” in *Srednjovjekovna naselja u svjetlu arheoloških izvora / Medieval settlements in the light of archaeological sources*, eds. Tajana Sekelj Ivančan, Tatjana Tkalčec, Siniša Krznar and Juraj Belaj, Serta Instituti archaeologici, Vol. 6, 337–388. Zagreb: Institut za arheologiju, 2017.

Kühtreiber, Thomas. “Alimentation and meat at medieval castles: social practice and economic structures from the archaeologist’s perspective”, In *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, edited by Günther Karl Kunst and Matthias Kucera, 55–61. Wien: Vienna Institute for Archaeological Science, 2010.

Kužir, Snježana and Tajana Trbojević Vukičević. „Životinjski nalazi s arheološkog lokaliteta Torčec – Gradić.” *Podravina: časopis za multidisciplinarna istraživanja* 3, no. 6 (2004): 117–121.

Kužir, Snježana, Tajana Trbojević Vukičević and Marko Poletto. „Životinjski ostaci sa srednjovjekovnih nalazišta u okolici Torčeca.” in Tajana Sekelj Ivančan *Podravina u ranom srednjem vijeku: rezultati arheoloških istraživanja ranosrednjovjekovnih nalazišta u Torčecu*, 339–371. Zagreb: Institut za arheologiju, 2010.

Lovrenčević, Zvonko. „Srednjovjekovne gradine u podravskoj regiji.“ *Podravski zbornik* 85 (1985): 168–199.

Mušič, Branko, Tatjana Tkalčec, Barbara Horn, Igor Medarić, and Petra Basar. „Geofizička istraživanja na arheološkome nalazištu Osijek Vojakovački – Mihalj u 2017. godini.“ *Annales Instituti archaeologici* 14 (2018): 80–87.

Pavleš, Ranko. „Apatovec, Cerovo brdo i neki susjedni posjedi u srednjem vijeku.“ *Cris: časopis Povijesnog društva Križevci* 6, no. 1 (2004): 35–46.

Pavleš, Ranko. „Gordova i Kontovec – dva srednjovjekovna vlastelinstva na području Grubišnog Polja.“ *Zbornik Janković* 3 (2018): 9–30.

Pavleš, Ranko. *Koprivničko i đurđevačko vlastelinstvo. Povijest, topografija, organizacija*, Koprivnica: self-published, 2001.

Rehazek, André and Elisabeth Marti-Grädel. “Animal remains reflecting different social identities: examples from sites in northern and western Switzerland.” In *Bestial mirrors. Using animals to construct identities in Medieval Europe*. ViaVIAS 2010/3, edited by Günther Karl Kunst and Matthias Kucera, 62–65. Wien: Vienna Institute for Archaeological Science, 2010.

Riedel, Alfredo. *The animal remains of the medieval Verona: an archaeozoological and palaeoeconomical study*. Memoriae del Museo civico di storia natural di Verona (II serie) Sezione scienze dell'uomo, n. 3. Verona: Museo civico di storia natural di Verona, 1994.

Sekelj Ivančan, Tajana and Tatjana Tkalčec, Arheološko nalazište Torčec – Gradić, *Podravina: časopis za multidisciplinarna istraživanja* 3, no. 6 (2004): 71–106.

Škiljan, Filip. *Kulturno historijski spomenici Zapadne Slavonije*. Zagreb: Srpsko narodno vijeće, 2010.

Tkalčec, Tatjana and Siniša Krznar. “Druga sezona arheoloških istraživanja kasnosrednjovjekovnog arheološkog kompleksa Grubišno Polje – Šuma Obrovi.” *Annales Instituti Archaeologici* 13 (2017): 64–72.

Tkalčec, Tatjana. “A nemesség várai és kisebb erődített lakóhelyei Észak-Horvátországban az újabb régészeti adatok tükrében.” *Castrum: a Castrum Bene Egyesület folyóirata* 22, no. 1-2 (2019): 33–51.

Tkalčec, Tatjana. “Arheološka istraživanja na lokalitetu Veliki Zdenci–Crni Lug 2018. godine.” *Annales Instituti archaeologici* 15 (2019): 107–116.

Tkalčec, Tatjana. “Arheološka istraživanja na srednjovjekovnome arheološkom kompleksu Osijek Vojakovački – Mihalj u 2018. godini.” *Annales Instituti archaeologici* 15 (2019): 153–166.

Tkalčec, Tatjana. “Earthwork elements of defensive systems of small strongholds in the Kingdom of Slavonia.” In *Fortifications, defence systems, structures and features in the past*, *Zbornik Instituta za arheologiju / Serta Instituti Archaeologici* 13, edited by Tatjana Tkalčec, Tajana Sekelj Ivančan, Siniša Krznar and Juraj Belaj, 333–342. Zagreb: Institute of archaeology, 2019.

Tkalčec, Tatjana. “Kasnosrednjovjekovni arheološki kompleks Grubišno Polje – Šuma Obrovi – probna arheološka istraživanja u 2015.” *Annales Instituti Archaeologici* 12 (2016): 99–112.

Tkalčec, Tatjana. “Small feudal residences in the North-Western Croatia: medieval hill forts and lowland moated fortifications.” *Castrum Bene* 13, *Burg und Dokumentation*, 12. –16. Juni 2013, Krems an der Donau, Österreich, (forthcoming). 2019.

Tkalčec, Tatjana. „Probna arheološka istraživanja visinskog gradišta Sveta Ana – Gradina 2010.“ *Annales Instituti Archaeologici* 7 (2011): 45–49.

Tkalčec, Tatjana. „Vojakovački Osijek-Mihalj – srednjovjekovni arheološki kompleks na gornjem toku Glogovnice.“ *Prilozi Instituta za arheologiju u Zagrebu* 24 (2007): 453–472.

Trbojević Vukičević, Tajana. „Arheozoološka analiza kasnosrednjovjekovnoga naselja / Archaeozoological analysis of the Late Medieval settlement.” in Kornelija Minichreiter and Zorko Marković, *Beketinci Bentež: naselja iz eneolitika, ranoga i kasnoga srednjeg vijeka / Beketinci Bentež: Eneolithic, Early Medieval and Late Medieval settlements*, 364–373. Zagreb: Institut za arheologiju, 2013.

Trbojević Vukičević, Tajana and Ivan Alić. „Arheozoološka analiza (Gradski park Virovitica; drveni piloti mosta).” in *Srednjovjekovna nizinska utvrda u Virovitici: osvrt na arheološka istraživanja*, edited by Mihaela Kulej, 39–44. Virovitica: Gradski muzej Virovitica, 2008.

Trbojević Vukičević, Tajana, Silvia Frančić and Snježana Kužir. “Analiza životinjskih kostiju iz srednjovjekovnog burga Vrbovca u Klenovcu Humskome.” in Tatjana Tkalčec, *Burg Vrbovec u Klenovcu Humskome: deset sezona arheoloških istraživanja*, 234–246. Gornja Stubica, Zagreb: Muzeji Hrvatskog zagorja, Institut za arheologiju, 2010.

Trbojević Vukičević, Tajana and Ana Štilinović. „Arheozoološka analiza kostiju s utvrde Čanjevo / Archaeozoological analysis of bones from fort Čanjevo.” in *Utvrda Čanjevo: istraživanja 2003-2007 / Fort Čanjevo: researches 2003-2007*, edited by Luka Bekić, 253–259. Visoko, Zagreb: Općina Visoko, Hrvatski restauratorski zavod, 2008.

Trbojević Vukičević, Tajana and Agata Kučko. „Procjena prehrambenih navika temeljem arheozoološke analize.” in *Stari grad Barilović: deset godina arheoloških istraživanja*, edited by Ana Azinović Bebek and Marijana Krmpotić, 110–117. Zagreb: Hrvatski restauratorski zavod, 2014.

## Archäozoologische Belege für Ernährungsgewohnheiten kleiner Burgbewohner im mittelalterlichen Slawonien

Diese Arbeit präsentiert Wissen über die Fleischernährung der Bewohner mittelalterlicher Befestigungsanlagen im Gebiet des Königreichs Slawonien (*regnum Sclavoniae*). Analyisierte Proben von Tierknochen stammen aus den archäologischen Stätten Veliki Zdenci–Crni Lug, Grubišno Polje–Šuma Obrovi 1, Sveta Ana–Gradina und Osijek Vojakovački–Mihalj (Abb. 1). Alle von ihnen gehören zu den sogenannten hochrangigen Stätten, die von der sozialen Elite des mittelalterlichen Slawoniens bewohnt wurden.

Bei der Analyse der Knochenreste wurden die Stratigraphie, die absolute Radiokarbondatierung bestimmter Kontexte und die typologischen Merkmale der anderen Funde aus den archäologischen Kontexten für jede Stelle berücksichtigt. Somit wurden drei Wohnhorizonte erkannt. Der früheste (13. bis 14. Jahrhundert) ist in den Stätten von Veliki Zdenci–Gradina, Osijek Vojakovački–Mihalj und Sveta Ana–Gradina vorhanden, der nächste Horizont (Ende vom 14. –15. Jahrhundert) wurde in den Stätten von Veliki Zdenci und Mihalj erkannt und der jüngste Horizont (Ende vom 15. Jahrhundert und Anfang vom 16. Jahrhundert) ist von den Stätten Veliki Zdenci und Grubišno Polje–Šuma Obrovi 1 präsentiert. Für jede archäologische Stätte (pro Kontext und Horizont) wurde die Anzahl der identifizierten Exemplare für jede Tierart bestimmt (Tab. 1), und in späteren Analysen werden die Standorte anhand der Ergebnisse des Prozentsatzes der Anzahl der identifizierten Exemplare (% NISP) verglichen.

Ein standortübergreifender Vergleich der Ernährungsgewohnheiten und der Verwendung von Tieren zu anderen Zwecken neben Fleisch als Lebensmittel in verschiedenen Zeiträumen, nämlich in bestimmten Horizonten einzelner untersuchter Standorte an den Knochenresten von Rindern, Schweinen, kleinen Wiederkäuern und Hühnern, konnte nur für zwei Horizonte durchgeführt werden - den frühesten und den spätesten (Abb. 11-12).

Im ersten Horizont unterscheidet sich Sveta Ana stark von anderen Standorten und zeigt durch die Fauna klare Merkmale eines Standorts mit hochrangigen Einwohnern. Mihalj auf der anderen Seite zeigt mehrere Hinweise auf eine Nicht-Elite-Stätte. In ähnlicher Weise zeigt Veliki Zdenci im ersten Horizont keine faunalen Indikatoren für den Elite-Standort, was sich im zweiten Horizont deutlich ändert, wenn einige eindeutige Hinweise auf den Elite-Verbrauch erkannt werden könnten. Im dritten Horizont ist der Rückgang des Wohlstands des Lebens in Zdenci offensichtlich, während in Grubišno Polje die Konsumgewohnheiten der Elite in mehreren Aspekten erkannt werden können.

Die zusammengefassten Ergebnisse der archäozoologischen Analyse der untersuchten vier Burgen werden auch mit den Ergebnissen der archäozoologischen Analysen von 7 archäologisch untersuchten und veröffentlichten hochrangigen Stätten verglichen und zusätzlich wurden auch die Ergebnisse von 5 veröffentlichten Nicht-Elite-Stätten, d.h. ländlichen Siedlungen berücksichtigt, um die Einblicke in die Fleischernährung an verschiedenen Standorten auf dem mittelalterlichen slawonischen Territorium zu erhalten (Tab. 2). Beim Vergleich der Anzahl identifizierter Exemplare von Wildtieren aus slawonischen Gebieten wurden die deutlichen Unterschiede zwischen ländlichen Siedlungstypen (1,57% wildes NISP) und Siedlungstypen mit hohem Status (5,25% wildes NISP), wie sie für ungarische Gebiete festgestellt wurden, nicht erkannt. Slawonische Schlösser passen besser zum Bild eines größeren europäischen Raums, in dem der Anteil des Wildes in den Schlössern zwischen 2 und 5% mit maximal 11% oszilliert.