

A characterization of nutritional stress among early Medieval subadult females of the central Dalmatian region of Croatia

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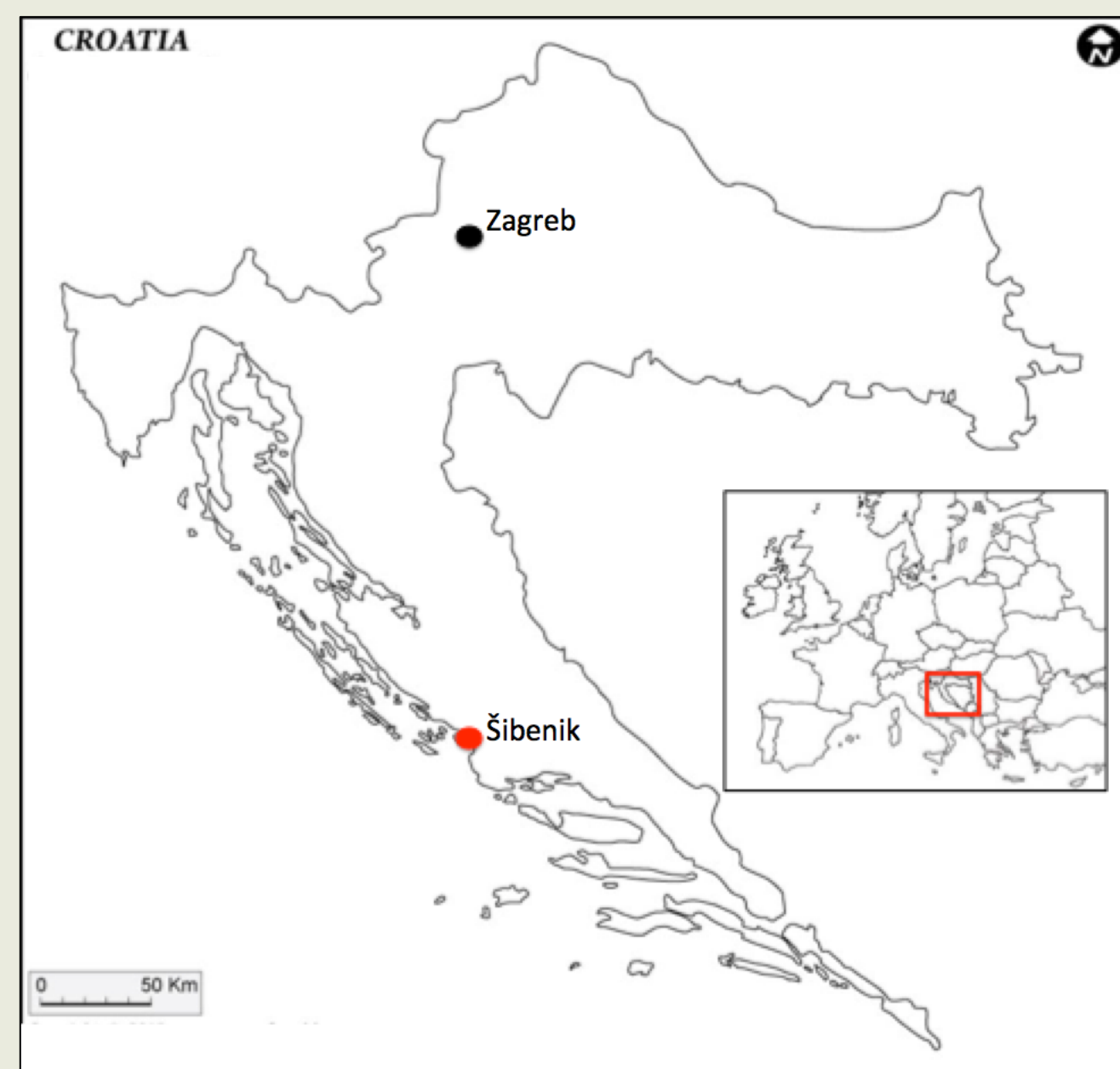


Figure 1: Regional map of Croatia with location of the Šibenik Sv. Lovre site identified.



Figure 2: Aerial photograph of the Šibenik-Sv. Lovre cemetery site and existing church of St. Lawrence. Typical Christian burials are visible in organized parallel rows. Graves are lined with large stone slabs. Image courtesy of Petrinec (2009).



Figure 3: Celtic wire earring retrieved from Sv. Lovre cemetery. Image courtesy of Lipovec (2011).



Figure 4: Single beaded filigree earrings retrieved from Sv. Lovre cemetery. Image courtesy of Krnčević (1998)

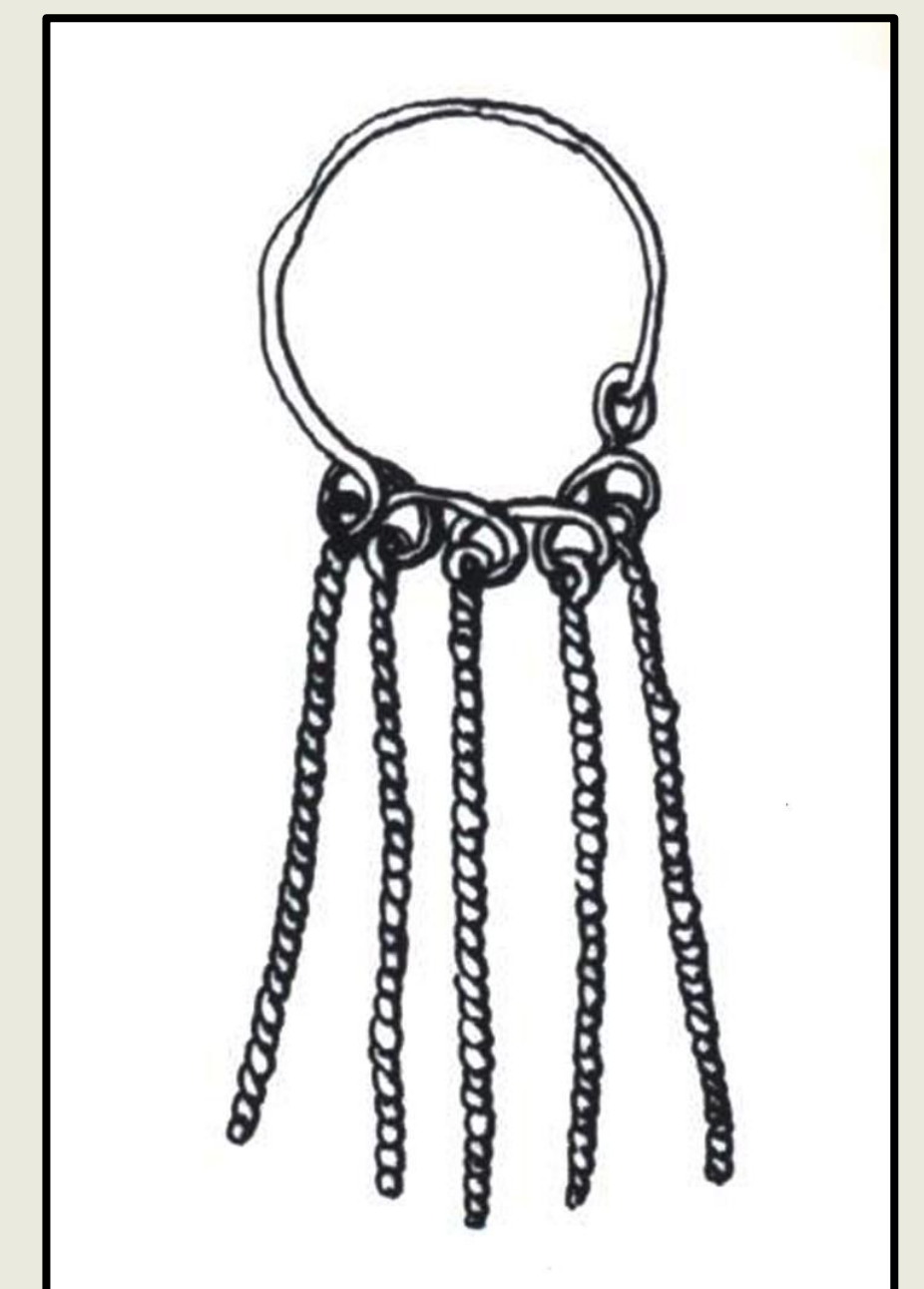


Figure 5: Celtic wire earring retrieved from Sv. Lovre cemetery. Image courtesy of Petrinec (2009).

Introduction

- The Šibenik-Sv. Lovre (Church of St. Lawrence) site (9th-11th centuries A.D.) is an early medieval church cemetery located in the rural surrounding of the medieval town of Šibenik (Figure 1) (Krnčević 1998). Typical of medieval Christian burials, the burials at the cemetery are in regular rows, using stone slab construction and include few grave goods (Figure 2). However, jewelry items, reflective of female costume items (filigreed earrings, simple hooped earrings and rings), accompany many of the burials, including subadult burials (Figures 3-4).
- It is rare in archaeological contexts to be able to estimate the sex of subadult individuals, and it is usually best done by taking into consideration the archaeological context along with the biological skeletal remains (Lewis 2007).
- The present study seeks to identify if the grave goods from the Šibenik-Sv. Lovre site correlate with adult female sex. If so, using a biocultural approach, this study applies female-sex to subadults with female-costume jewelry grave goods.
- Secondly, this study seeks to then identify if socially applied differences affect subadult health. Specifically, the study tries to identify if subadult females from the site show differences in their health status.

Methods

- Biological sex of adult individuals were estimated following standard procedures (Buikstra and Ubelaker 1999). All subadult age estimates were established using standard procedures, based on dental development and epiphyseal union (Buikstra and Ubelaker 1999).
- All subadults were assessed for the presence of scurvy, cribra orbitalia, porotic pitting and hyperostosis.
- The presence of grave goods is tested using Fisher's exact test against the biological sex of adults, to determine if grave goods are associated with a single sex.
- Nine subadult females were identified based on the presence of female-costume grave goods.
- Since all subadult females were over the age of 3-4 years, subadult females were compared only to indeterminate-sex children, juveniles and adolescents. Infant subadults were excluded from comparison for health differences.
- Fisher's exact tests were used to establish significance at the $p < .05$ level

Table 1: Demographic profile of Šibenik Sv Lovre cemetery. Values in parentheses indicate the number with grave goods present.

	Females	Males	Indeterminate	Total
Adult	30 (22)	23 (0)	2 (NA)	55 (22)
Adolescent (10-18)	2 (2)	0	5 (2)	7 (4)
Juvenile (6-10)	0	0	4 (2)	4 (2)
Child (2-6)	0	0	11 (3)	11 (3)
Infants (0-2)	0	0	13 (0)	13 (0)
Total	32 (24)	23 (0)	35 (7)	90 (31)

Table 2: Presence of Grave Goods among sexable adults

	Adult Females	Adult Males	Fisher's p-value
Grave Goods Present	22	0	P=0.0001
Grave Goods Absent	8	23	
Total	30	23	

Results

- Among 53 sexable adults, grave goods positively correlated with female sex. ($n=22/30$; Fisher's p -value=0.0001) (Table 2).
- No males ($n=0/23$) at the site had grave goods (Table 1 & 2).
- Nine subadults were estimated to be female sex based on the presence of grave goods (Table 1).
- The nine subadult females are all estimated over the age of 3-4 years.
- Compared to indeterminate sex children, juveniles and adolescents ($n=22$), subadult females are not statistically more likely to have suffered from scurvy, cribra orbitalia, porotic pitting, nor periostitis (Table 3). There were no observed cases of hyperostosis among the subadult sample from Šibenik Sv. Lovre.

Table 3: Presence of nutritional pathologies among subadult females and indeterminate subadults

	Subadult Females	Indeterminate Subadults (>3yrs)	Totals	Fischer's p-value
	# present/total obs.	# present/total obs.	# present/total obs.	
CO	6/8	8/11	14/19	P=1.0000
SP	2/8	1/11	3/19	P=0.5459
?SP	4/8	2/11	6/19	P=0.3189
PP	4/8	3/11	7/19	P=0.3213
NSI	1/8	2/13	3/21	P=1.0000
ALL PATH	7/8	9/11	16/19	P=1.0000

Conclusion

- Based on the presence of female-costume jewelry grave goods and that all subadults with female grave good items are over the age of 3-4 years, it would appear that the social age of femaleness is applied during early childhood, after weaning.
- Results indicate that subadult health status at the site is not affected by biological sex (or female-sex), and that any socially applied gender differences do not affect subadult nutritional health.
- Future studies are planned to examine any correlations between subadult female sex and the presence of LEH and trauma. In addition, future studies may incorporate the results of recent aDNA work by Dr. Mario Novak.

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