



**Encontro de Zooarqueologia
Ibérica (EZI2017)**

**5ª Reunião Científica
de Arqueomalacologia
da Península Ibérica (5RCAPI)**

**26-29 April 2017
Faro – Portugal**

Book of Abstracts

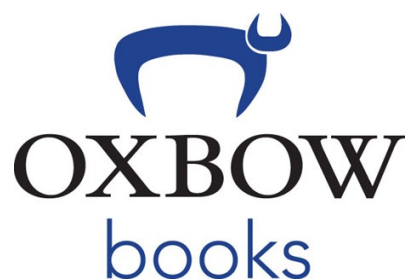
**Edited by
Maria João Valente
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**Encontro de Zooarqueologia Ibérica (EZI2017) e
5ª edição da Reunião Científica
de Arqueomalacologia Ibérica (5RCAPI)**

Iberian Zooarchaeology Meeting 2017 (EZI2017) and
5th Iberian Peninsula Archaeomalacology
Scientific Meeting (5RCAPI)

26–29 April 2017, Faro – Portugal

BOOK OF ABSTRACTS

Edited by:

Maria João Valente, Cláudia Costa & Cleia Detry

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Organisation

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POSTER SESSION EZI2017

EP.1 | BIOACCUMULATION OF METALS IN ANIMAL'S BONES IN THE SW OF SPAIN. FIRST RESULTS USING PIXE TECHNIQUE IN COPPER AGE SAMPLES

Esteban García-Viñas [1], Blanca Gómez Tubío [2], Inés Ortega-Feliú [3] & Eloísa Bernáldez-Sánchez [1,4]. Contact: egarvin@upo.acu.es

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The bone tissue is a reservoir of some essential elements for the organism, but also this tissue can accumulate metals produced by pollution. In the SW of Spain some chemical analysis in shells and soils dating in the Copper Age have shown high concentrations of copper (Cu) in the environment (Aléx et al., 2004; Nocete et al., 2005; Carretero et al., 2010). In ancient bones, several processes (during the fossilization) could change the results of chemical analysis due to processes of dissolution, precipitation, absorption, mineral substitution or recrystallization. Our team has essayed different protocols to clean bone samples before use PIXE technique (García-Viñas et al., forthcoming). These protocols were based on the results of Price et al. (1992), Carvalho et al. (2004) and Shafer et al. (2008). After this essay, we have analyzed eight bones from a Copper Age site (Valencina de la Concepción, Seville) with two main objectives: to check this protocol and to obtain a first overview about the metal bioaccumulation in animals due to ancient pollution produced by metallurgy. Our first results show bioaccumulation of Cu and Zn (zinc) in four bone samples, half of the samples analyzed: one cattle, one caprine, one suid and one red deer. These preliminary results could show that the pollution during the Copper Age affects the vertebrate community completely, wild and domesticated species.

Keywords: PIXE technique, trace elements, diagenesis, bioaccumulation, subfossil, Copper age, South of Spain.

References: Aléx, E., Nocete, F., Nieto, J.M., Sáez, R., Bayona, M.R., 2004. Estudio del impacto medioambiental de la metalurgia prehistórica en el Andévalo onubense: contaminación de las aguas, deforestación y erosión, in: Nocete, F. (coord.), Odiel. Proyecto de investigación arqueológica para el análisis del origen de la desigualdad social en el suroeste de la Península Ibérica. Arqueología Monografías. Junta de Andalucía, Sevilla, pp. 325-342. Carretero, M.I., Pozo, M., Gómez, F., Ruiz, F., Abad, M., González, M.L., Rodríguez, J., Cáceres, L., Toscano, A., Baptista, M.A., Silva, P., Font, E., 2010. Primeras evidencias de contaminación histórica en el Parque Nacional de Doñana (SW de España). *Studia Geologica Salmanticensia* 46 (1), 65-74. Carvalho, M.L., Marques, A.F., Llima, M.T., Reus, U., 2004. Trace elements distribution and post-mortem intake in human bones from Middle Age by total reflection X-ray fluorescence. *Spectrochimica Acta Part B* 59, 1251–1257. García-Viñas, E., Gómez, B., Ortega-Feliú, I., Bernáldez, E., in press. Análisis PIXE en muestras óseas subfósiles: ensayo de un protocolo de preparación. *digitAR – Revista Digital de Arqueología, Arquitectura e Artes*. Nocete, F., Álex, E., Nieto, J.M., Sáez, R., Bayona, M.R., 2005. An archaeological approach to regional environmental pollution in the south-western Iberian Peninsula related to Third millennium BC mining and metallurgy. *Journal of Archaeological Science* 32, 1566-1576. Price, T.D., Blitz, J., Burton, J., Ezzo, J.A., 1992. Diagenesis in Prehistoric Bone: Problems and Solutions. *Journal of Archaeological Science* 19, 513-529. Shafer, M.M., Sikerb, M., Overdier, J.T., Ramsle, P.C., Teschler-Nicolad, M., Farrell, P.M., 2008. Enhanced methods for assessment of the trace element composition of Iron Age bone. *Science of the Total Environment* 401, 144-161.

EP.2 | BIOSTRATINOMIC ESSAY IN BONES IMMERSED IN MARINE WATER: PRELIMINARY RESULTS

Esteban García-Viñas [1], Eloísa Bernáldez-Sánchez [1,2], T. Fernández [3] & M. Bethencourt [3]. Contact: egarvin@upo.acu.es

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In 2012 we studied the faunistic record from two shipwrecks, dated between 16th and 17th centuries, located in Cadiz Harbor (Spain). The faunal assemblage was composed of 120 bones of cattle, caprines, suids, cats and birds that were found in different states of degradation (Bernáldez et al., 2013). After this research, we had two main questions, one of these related to the time of exposition of the bones before they were buried and other one related to the origin of these bones: garbage from the navies or from slaughterhouses located in the bay. The main objective of this research is trying to solve both questions. Some bone fragments of tibia and femur of cattle were placed underwater in the Cadiz coast, half of them were boiled until removing the collagen. These samples were collected at different times around a year to study the bioerosion and the chemical changes in the bone structure using SEM (Scanning electron microscopy) and EDX (Energy dispersive X-ray spectroscopy). Finally, the results will be compared with ancient bones studied in shipwrecks.

Keywords: biostratinomy, bioerosion, SEM, EDX, taphonomy, actualistic study

References: Bernáldez, E., Gamero, M., García-Viñas, E., Higuera, J.M., Gallardo, M., Alzaga, M., Gómez, A., 2013. Proyecto Delta: un retazo de la vida cotidiana en la bahía de Cádiz, in: *Actas del Primer congreso de arqueología naval y subacuática*. Ministerio de Educación, cultura y Deporte, Madrid, pp. 1095-1108.