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## TOMOGRAPHY APPLIED TO THE STUDY OF DINOSAUR FOSSILS FROM THE COLLECTION OF THE MUSEUM OF LOURINHÃ (PORTUGAL)

### TOMOGRAFIA APLICADA AO ESTUDO DE FÓSSEIS DE DINOSSAURO DO ESPÓLIO DO MUSEU DA LOURINHÃ (PORTUGAL)

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## 1 - INTRODUCTION

The Museum of Lourinhã hosts one of the most varied and best-preserved collection of dinosaur fossils in Portugal. The pursue for non-destructive techniques that allow the visualization of the internal morphology of fossils is a central challenge for paleontology. Here we report high-resolution three-dimensional tomographic datasets obtained using Synchrotron Radiation-based Micro-Computed Tomography (SR $\mu$ CT). Combining all the benefits of non-destructive imaging techniques will ensure that rare fossils remain preserved for future generations to enjoy and further analyse them.

## 2 - EXAMPLES

Several fossilized dinosaur eggshell fragments and embryonic bones have been studied by SR $\mu$ CT at the HARWI II and BW2 beamlines, respectively. These beamlines are operated by the Helmholtz-Zentrum Geesthacht at the storage ring DORIS III at the Deutsches Elektronen-Synchrotron DESY.

The data recorded for eggshells provide three-dimensional visualization of the pore morphology and connectivity of the pore in the eggshells. More details about the experimental procedure as well as results obtained for dinosaur eggshells collected in the Lourinhã Formation can be found in Martins *et al.* (2011). SR $\mu$ CT data recorded for a dinosaur embryonic vertebra (ML565\_Paim55) found in the Paimogo nest, comprising the oldest dinosaur embryonic remains reported in Europe (Mateus *et al.*, 1997), are presented in Figure 1.

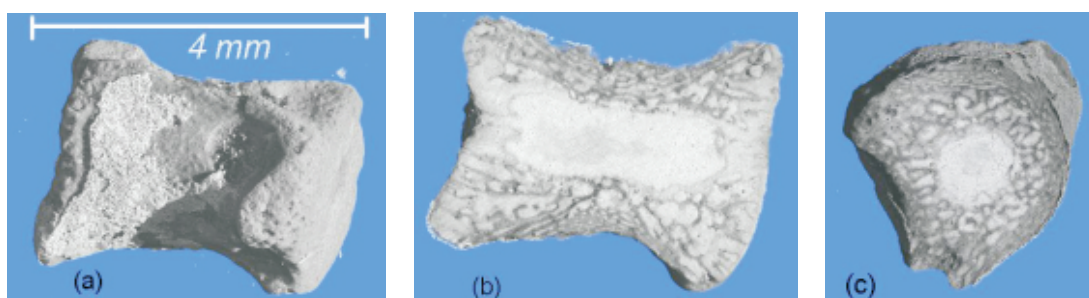


Fig. 1 – Embryonic vertebra of *Lourinhanosaurus antunesi* found in the nest recovered from Paimogo site: (a) three-dimensional-representation by VGStudio Max 1.2.1; (b) sagittal section of the vertebra; (c) centrum transverse section of the vertebra. The specimen was imaged in absorption mode with photon energy of 24 keV. The effective pixel size corresponds to 3.5  $\mu$ m.

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