

Fauna 3D modelling contribution for zooarchaeological research: a pilot study on pig paediatric specimens

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Objectives: Within the collaborative “CRIAS project”, we aim to contribute to expanding the Archaeosciences Laboratory’s osteological reference collection, a fundamental tool for high-resolution analysis of Iberian fauna in archaeology. Yet, specimens of paediatric age are under-represented and bone elements’ digital 3D representations are lacking. Building up a digital image collection of extant fauna is valuable.

Material and Methods: Two skeletons from *Sus scrofa domesticus* (domestic pig, 12 weeks of age), #3049 (female) and #3050 (male), whose osteometric study was completed before, had their appendicular skeleton scanned using the space spider Artec equipment. 3D reconstructions were possible using the software ArtecStudio18 and Blender3.9. Indirect measurements of the humerus, radius, ulna, femur, tibia and fibula (diaphysis, left side elements), such as greatest length and greatest breadth of the proximal and distal ends (in mm), were collected from the 3D models. A comparison was investigated with reference measurements collected by an experienced observer and directly using a standard calliper (0,01mm precision). Relative differences (%) were calculated.

Results: In total, 19 skeletal elements were digitized for each specimen and 3D reconstructions were obtained. Relative differences values fell within the interval [-3,36, +3,29%], with one exception, the 8,37% value (for tibia greatest breadth, distal end). Paediatric specimens’ 3D digitization faced technical challenges, i.e. some anatomical parts are of small size and concerning measurements’ precision, caution is needed since the osteological landmarks, as seen in adults, are undeveloped.

Conclusion: More evidence is needed for other species, over several bone elements and age classes. These digital assets have the potential to be used as accurate references in zooarchaeological studies: it offer the possibility to generate and access 3D model reconstructions, virtual skeletons with motion, anatomical elements identified, and digital tools for measurements. These collections are regularly used for training and research.

Keywords: 3Ddigitization, Fauna, Pig anatomy, Veterinary paediatrics, Zooarchaeology.

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