Dataset

3D models related to the publication: Comparative anatomy and phylogenetic contribution of intracranial osseous canals and cavities in armadillos and glyptodonts (Xenarthra, Cingulata)

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Abstract
The present 3D Dataset contains the 3D models analyzed in the following publication: Le Verger K., González Ruiz L.R., Billet G. 2021. Comparative anatomy and phylogenetic contribution of intracranial osseous canals and cavities in armadillos and glyptodonts (Xenarthra, Cingulata). Journal of Anatomy. https://doi.org/10.1111/joa.13512

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INTRODUCTION

The phylogeny of the Cingulata has been debated in morphological analyses for a long time (Engelmann, 1985; Gaudin & Wible, 2006; Billet *et al*., 2011; Delsuc *et al*., 2016; Mitchell *et al*., 2016; Herrera *et al*., 2017) and this incongruence was enriched by the contribution of recent molecular analyses (Delsuc *et al*., 2016; Mitchell *et al*., 2016). This is particularly the case for the emblematic group of glyptodonts whose mitochondrial genome was recently assembled (Delsuc *et al*., 2016; Mitchell *et al*., 2016). Although the cranial anatomy is relatively well known in xenarthrans, their internal cranial anatomy remains poorly studied. Yet, several studies have shown that their exploration provides systematic interest on their past and present diversity (Zurita *et al*., 2011; Fernicola *et al*., 2012; Billet *et al*., 2015; Tambusso & Fariña, 2015a; Tambusso & Fariña, 2015b; Billet *et al*., 2017; Boscaini *et al*., 2018; Boscaini *et al*., 2020; Tambusso *et al*., 2021). In a recent study (Le Verger *et al*., 2021), we describe and compare 8 cranial canals (involved in the vascularization and innervation of the cranium) and alveolar cavities (Figure 1) of 30 specimens belonging to the Cingulata. In this sampling, all extant subfamilies are represented and several large fossil groups including giant forms such as pampatheres and glyptodonts are represented. For the latter, the oldest complete crania have been studied. A sloth and an anteater were also added to the sample as outgroup. Of the total sample, 3D models of 13 specimens are made available (Table 1). The rest of the specimens are available only upon request from LGR. In this study (Le Verger *et al*., 2021), we present the comparative investigation of these intracranial osseous canals and alveolar cavities using X-ray microtomography. Their 3D virtual reconstruction enabled us to compare the locations, trajectories, and shape of each homologous structure and discuss their potential interest for cingulate systematics.

METHODS

The acquisition of each specimen was obtained by X-ray microcomputed tomography (CT-Scan) but the scan parameters and scanners used vary depending on the specimen. For the 13 specimens for which we provide 3D models, the stack of digital µCT images in .TIFF format was uploaded to the MorphoSource portal with all scan parameters and associated information. We digitally segmented (manually) and reconstructed the 8 endocranial canals and all alveolar cavities on one side of the cranium for each specimen with MIMICS v. 21.0 software (3D Medical Image Processing Software, Materialize, Leuven, Belgium). The cranium of each specimen was also 3D reconstructed. The 3D surface models are provided in .PLY format, and can therefore be opened with a wide range of freeware.

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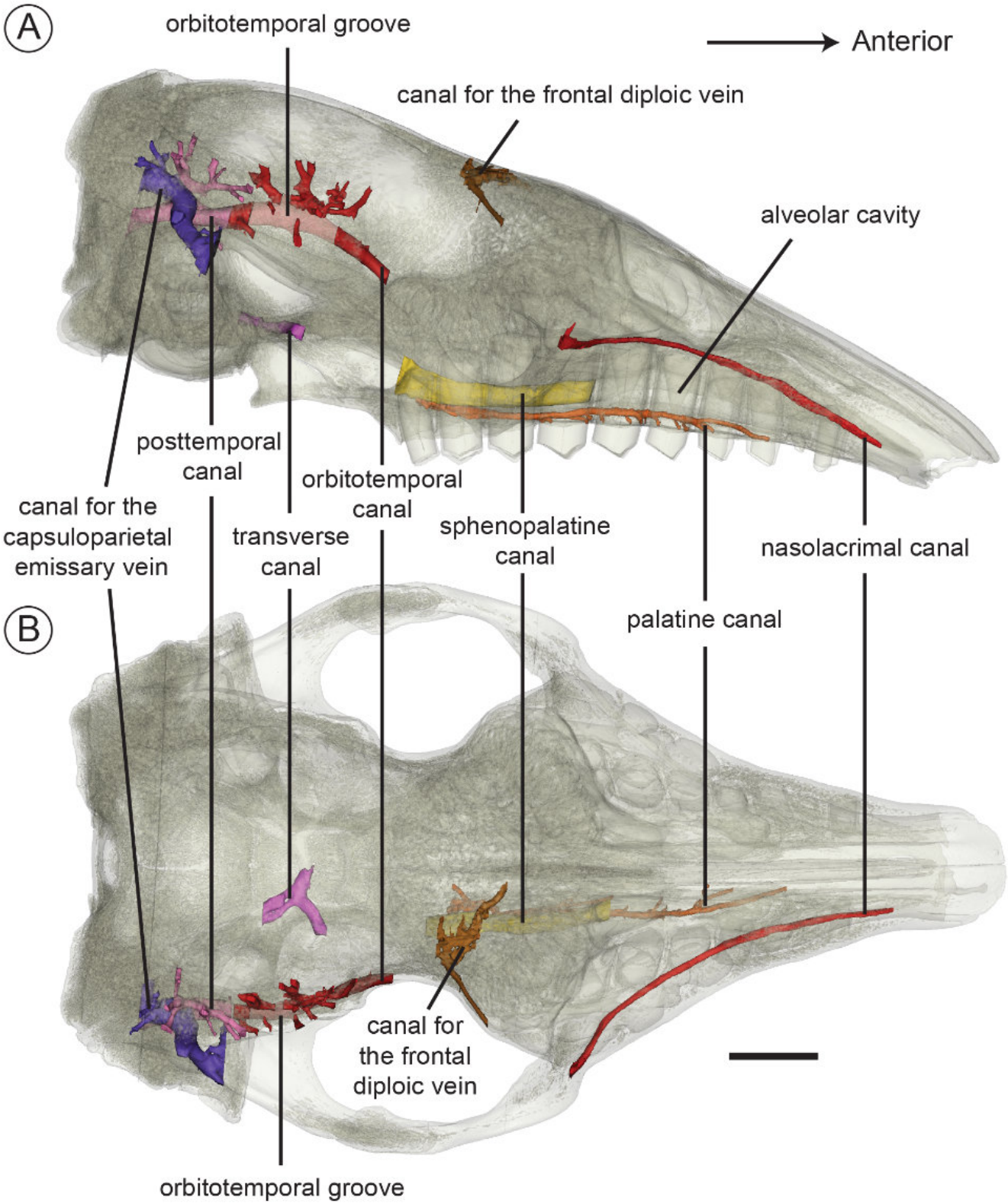

Figure 1. Illustration of the selected internal canals on the transparent cranium of *Euphractus sexcinctus* AMNH 133304 in right lateral (A) and ventral (B) views. Scale = 1 cm.

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Inv nr.	Taxon	Available models
MNHNZM-MO-1999-1065	*Bradypus tridactylus*	ac; cev; cfdv; cr; nlc; otc; plc; ptc; spc
NHMUKZD-1903.7.7.135	*Tamandua tetradactyla*	cev; cfdv; cr; fubc; nlc; otc; plc; ptc; spc; tvc
AMNH33150	*Dasypus novemcinctus**	ac; cev; cfdv; cr; gnlc; nlc; otc; plc; ptc; spc; tvc
AMNH133261	*Dasypus novemcinctus***	ac; cev; cfdv; cr; gotc; gptc; nlc; otc; plc; ptc; spc; tvc
AMNH133328	*Dasypus novemcinctus****	ac; cev; cfdv; cr; gotc; nlc; otc; plc; ptc; spc; tvc
ZMB-MAM-49039	*Zaedyus pichiy* *	ac; cev; cfdv; cr; nlc; otc; plc; spc
MHNG1627.053	*Zaedyus pichiy* **	ac; cev; cfdv; cr; gotc; nlc; otc; plc; ptc; spc; tvc
MHNG1276.076	*Zaedyus pichiy* ***	ac; cev; cfdv; cr; gotc; nlc; otc; plc; ptc; spc; tvc
NBC_ZMA.MAM.26326.a	*Cabassous unicinctus***	ac; cev; cfdv; cr; nlc; otc; plc; ptc; spc; tvc
MNHN-CG-1999-1044	*Cabassous unicinctus*****	ac; cev; cfdv; cr; gotc; nlc; otc; plc; ptc; spc; tvc
FMNHP14424	*Vassallia maxima* †	ac; cev; cr; fubc; nlc; otc; plc; ptc; spc; tvc
MNHN-F-PAM-759	*Glyptodon sp.* †	ac; cev; cr; fubc; gcev; nlc; otc; plc; ptc; spc
MNHN-F-PAM-760	*Glyptodon sp.* †	ac; cev; cr; fubc; gcev; nlc; otc; plc; ptc; spc

Table 1. List of List of specimens. Symbol: †, extinct species; *, perinatal stage; **, juvenile; ***, subadult; ****, adult. Abbreviations: ac, alveolar cavities; cev, canal for the capsuloparietal emissary vein; cfdv, canal for the frontal diploic vein; cr, cranium; fubc, fusion area of the braincase canals; gcev, groove for the capsuloparietal emissary vein; gnlc, groove for the nasolacrimal canal; gotc, groove for the orbitotemporal canal; gptc, groove for the posttemporal canal; nlc, nasolacrimal canal; otc, orbitotemporal canal; plc, palatine canal; ptc, posttemporal canal; spc, sphenopalatine canal; tvc, transverse canal. MNHN: Muséum National d'Histoire Naturelle, Paris, France. NHMUK: Natural History Museum, London, UK. AMNH: American Museum of Natural History, New York, USA. ZMB: Museum für Naturkunde, Berlin, Germany. MHNG: Muséum d'Histoire Naturelle de Genève, Switzerland. NBC: Natural Biodiversity Center, Leiden, Netherlands. FMNH: Field Museum of Natural History, Chicago, USA.

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