

3D models related to the publication: Comparative endocranial traits in the crocodylians *Leidyosuchus canadensis* and *Stangerochampsia mccabei* from the upper Cretaceous of Alberta, Canada.

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Abstract

This contribution contains the 3D models of the paratympanic sinus system, the endocast and the neurovascular bony canal of the maxilla, premaxilla and the jugal of *Leidyosuchus canadensis* and *Stangerochampsia mccabei* described and figured in the following publication: G. Donzé, G. Perrichon, P. Vincent, JE. Martin, 2026. Comparative endocranial traits in the crocodylians *Leidyosuchus canadensis* and *Stangerochampsia mccabei* from the upper Cretaceous of Alberta, Canada. Journal of Anatomy.

Keywords: Endocast, Leidyosuchus, neurovascular canals, Paratympanic sinus system, Stangerochampsia

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INTRODUCTION

The aim of our article was to describe for the first time the endocranial structures of *Leidyosuchus canadensis* Lambe (Lambe, 1907) and *Stangerochampsia mccabei* (Wu et al, 1996), two alligatoroids of the Late Cretaceous in Canada (Eberth et al. 2023, Ramezani et al. 2022). These descriptions were compared with those of actual crocodylians and with one cretaceous fossile. We reconstructed the skull, paratympanic sinuses, endocast and neurovascular canals in the jugal, maxilla of one specimen of *Leidyosuchus canadensis* (TMP1986.221.1), *Stangerochampsia mccabei* (TMP1986.61.1), *Crocodylus niloticus* (MHNL 50001399), *Alligator sinensis* (NHMW-Zoo-HS-37966), *Alligator mississippiensis* (OUVC9761) and *Diplocynodon ratelii* (LA86) and the neurovascular canals in the premaxilla of *Leidyosuchus canadensis* (TMP1986.221.1), *Stangerochampsia mccabei* (TMP1986.61.1) (Fig 1 and Table 1). These reconstructions allow us to highlight the importance of endocranial structures and to make assumptions over their phylogenetic impact.

METHODS

The 3D surfaces were extracted semi-automatically within AVIZO 9.5 for MHNL 50001399 and OUVC 9761, and withing Amira 2023.2 for NHMW-Zoo-HS-37966, TMP1986.221.1 and TMP 1986.61.1 using the segmentation threshold selection tool. The 3D surface models are provided in .ply format, and can therefore be opened with a wide range of freeware.

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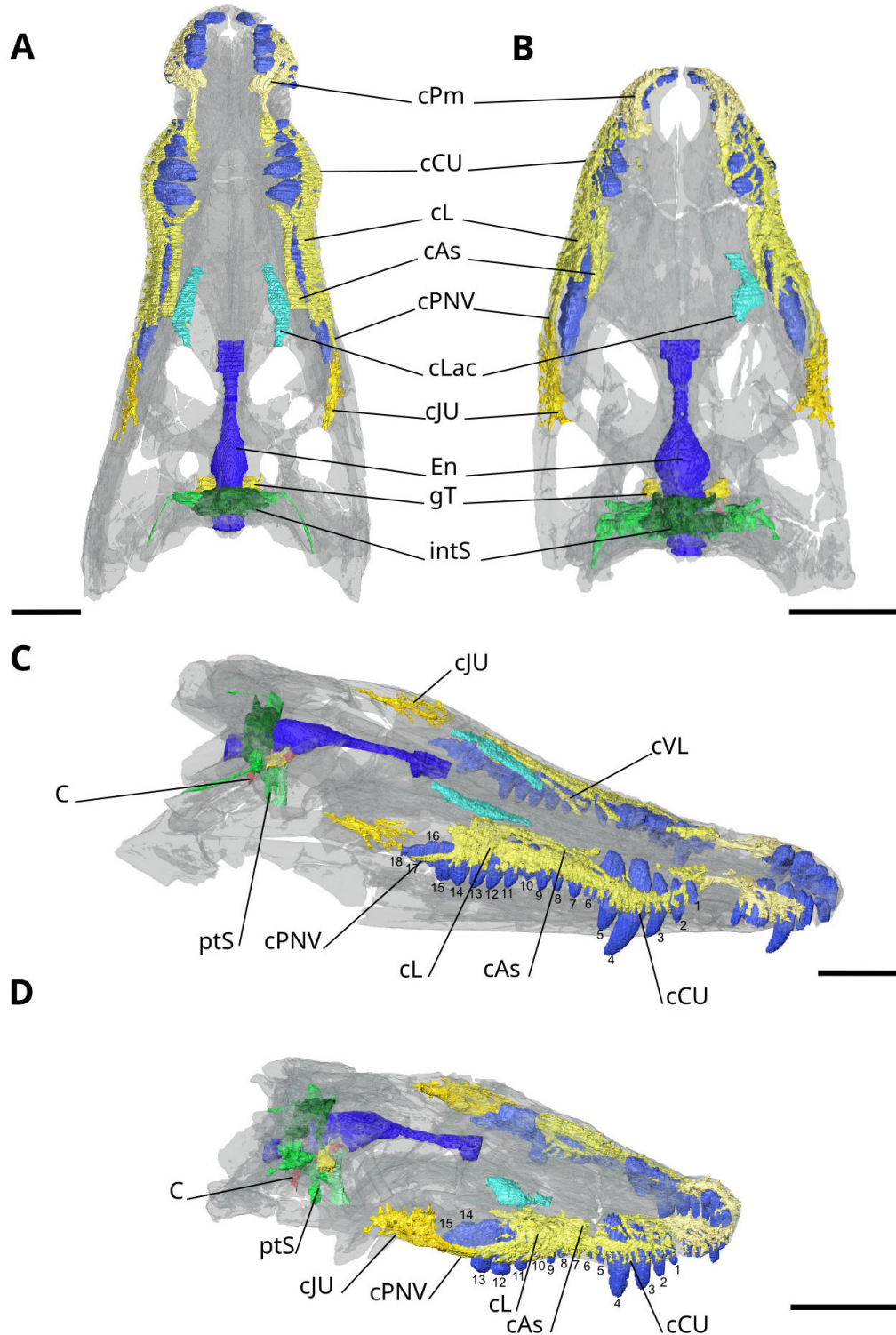


Figure 1. Endocranial structures of *Leidyosuchus* (TMP1986.221.1) and *Stangerochampsia* (TMP1986.61.1). Dorsal view of *Leidyosuchus* (TMP1986.221.1) (A) and *Stangerochampsia* (TMP1986.61.1) (B). Dorsolateral view of *Leidyosuchus* (TMP1986.221.1) (C) and *Stangerochampsia* (TMP1986.61.1) (D). C: Cerebral carotid artery ; cA: Canal for the passage of alveolar nerves ; cAs: Superior alveolar canal ; cCU: Canal for the passage of the cutaneous branch of the trigeminal nerve ; cJU: Canal for the passage of the jugal branch of the maxillary division of the trigeminal nerve ; cL : Labial canal ; cLac : Lacrymal canal cPm: Canal for the passage of the premaxillary branch of the maxillary division of the trigeminal nerve ; cPNV: Posterior neurovascular canal ; cVL: Ventrolingual canal ; En: Endocast ; gT: Trigeminal ganglion ; intS: intertympanic Sinuses ; ptS: Pharyngotympanic Sinuses ; nT: Trigeminal nerve. Light blue represent tooth alveoli; dark yellow represents jugal canals; yellow represents maxillary canals and light yellow represents premaxillary canals. Numbers on the laterodorsal views represent the position of maxillary teeth. Scalebars represent 5 cm.

Inv nr.	Taxon	Type of CT Scan	CT scan location	Voxel size
TMP1986.221.1	<i>Leidyosuchus canadensis</i>	Medical scanner	Canada Diagnostics, Calgary	538 x 497 x 657 µm ³
TMP1986.61.1	<i>Stangerochampsia mccabei</i>	Medical scanner	Canada Diagnostics, Calgary	428 x 499 x 673 µm ³
LA86	<i>Diplocynodon ratelii</i>	Microtomograph	Phoenix, Lyon	86 µm ³
OVC 9761	<i>Alligator mississippiensis</i>	Medical scanner	Ohio Health O'Bleness Hospital	500 x 500 x 1000 µm ³
NHFW-Zoo-HS-37966	<i>Alligator sinensis</i>	Microtomograph	Naturhistorisches Museum Wien	84 µm ³
MHNL 50001399	<i>Crocodylus niloticus</i>	Microtomograph	DTHE, INSA Lyon	102 µm ³

Table 1. List of models. Collections: Royal Tyrrell Museum; Musée des Confluences; Ohio University Vertebrate Collection; Naturhistorisches Museum Wien.

3 v1:219-44.

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