

3D models related to the publication: Brief comment on the brain and inner ear of *Giganotosaurus carolinii* (Dinosauria: Theropoda) based on CT scans.

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Abstract

This contribution contains the 3D models described and figured in the following publication: Paulina-Carabajal, A., Nieto, M.N. *In Press*. Brief comment on the brain and inner ear of *Giganotosaurus carolinii* (Dinosauria: Theropoda) based on CT scans. *Ameghiniana*. <https://doi.org/10.5710/AMGH.25.10.2019.3237>

Keywords: Carcharodontosauridae, Cranial Endocast, CT scans, Endosseous Labyrinth, Paleoneurology

Submitted: 2019-12-10, published online: 2020-04-01. <https://doi.org/10.18563/journal.m3.108>

Inv nr	Taxon	Description
MUCPv-CH-1	<i>Giganotosaurus carolinii</i>	Braincase, endocast and inner ears

Table 1. Related specimen. Collection: Museo Ernesto Bachman (MEB), El Chocón Neuquén, Argentina.

INTRODUCTION

The neuroanatomy of Carcharodontosaurinae (sensu Novas et al., 2013) theropods, is known for only two taxa (and two specimens): *Carcharodontosaurus saharicus* (Depéret and Savorin 1925) from the Upper Cretaceous of Africa, and *Giganotosaurus carolinii* (Coria and Salgado 1995) from the Upper Cretaceous of South America. The endocranial cavity of the type braincase of *G. carolinii* was emptied of sediment and a latex endocast was made (Paulina-Carabajal and Canale, 2010). The latter lacked certain structures since their osseous correlates were still infilled with sediment or broken. A recently made CT scan of the braincase of *G. carolinii* allowed the digital reconstruction of a more complete cranial endocast, plus the first reconstruction of the inner ear for this taxon (see Fig. 1 and table 1). As a result, a most accurate identification of the neurovascular cranial foramina of the braincase, formerly described by Coria and Currie (2002) and Paulina-Carabajal (2009), was made (Paulina-Carabajal and Nieto, in press).

METHODS

The 3D surfaces were extracted semi-automatically within MIMICS 18.0 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.

ACKNOWLEDGEMENTS

Grant sponsors: 1. Agencia Nacional de Promoción Científica y Tecnológica. Grant number: 1. PICT-2016-0481 to AP-C.

BIBLIOGRAPHY

- Coria, R.A. and Currie, P.J. 2002. The braincase of *Giganotosaurus carolinii* from the Upper Cretaceous of Argentina. *Journal of Vertebrate Paleontology* 22: 802–811. [https://doi.org/10.1671/0272-4634\(2002\)022\[0802:TBOGCD\]2.0.CO;2](https://doi.org/10.1671/0272-4634(2002)022[0802:TBOGCD]2.0.CO;2)
- Coria, R.A. and Salgado, L. 1995. A new giant carnivorous dinosaur from the Cretaceous of Patagonia. *Nature* 377: 224–226. <https://doi.org/10.1038/377224a0>
- Depéret, C. and Savorin, J. 1925. Sur la découverte d'une faune de vertèbres albiens a Timimoun (Sahara occidental). *Comptes Rendus hebdomadaires des séances de l'Académie des Sciences* 181: 1108–1111. <https://gallica.bnf.fr/ark:/12148/bpt6k3134w/f1108.image>
- Novas, F.E., Agnolín, F.L., Ezcurra, M.E., Porfiri, J. and Canale, J.I. 2013. Evolution of the carnivorous dinosaurs during the Cretaceous: The evidence from Patagonia. *Cretaceous Research* 45: 174–215. <https://doi.org/10.1016/j.cretres.2013.04.001>
- Paulina-Carabajal, A. 2009. El neurocráneo de los dinosaurios Theropoda de la Argentina: osteología y sus implicancias filogenéticas. Doctoral Thesis, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Buenos Aires. 650 p. Unpublished. http://naturalis.fcnymlp.edu.ar/repositorio/_documentos/tesis/tesis_999.pdf
- Paulina-Carabajal, A. and Canale, J.I. 2010. Cranial endocast of the carcharodontosaurid theropod *Giganotosaurus carolinii* CORIA & SALGADO, 1995. *Neues Jahrbuch für Geologie und Paläontologie*, Abhandlungen 258: 249–256. <https://doi.org/10.1127/0077-7749/2010/0104>
- Paulina-Carabajal, A. and Nieto, M. N. 2020. Brief comment on the brain and inner ear of *Giganotosaurus carolinii* (Dinosauria: Theropoda) based on CT scans. *Ameghiniana* <https://doi.org/10.5710/AMGH.25.10.2019.3237>

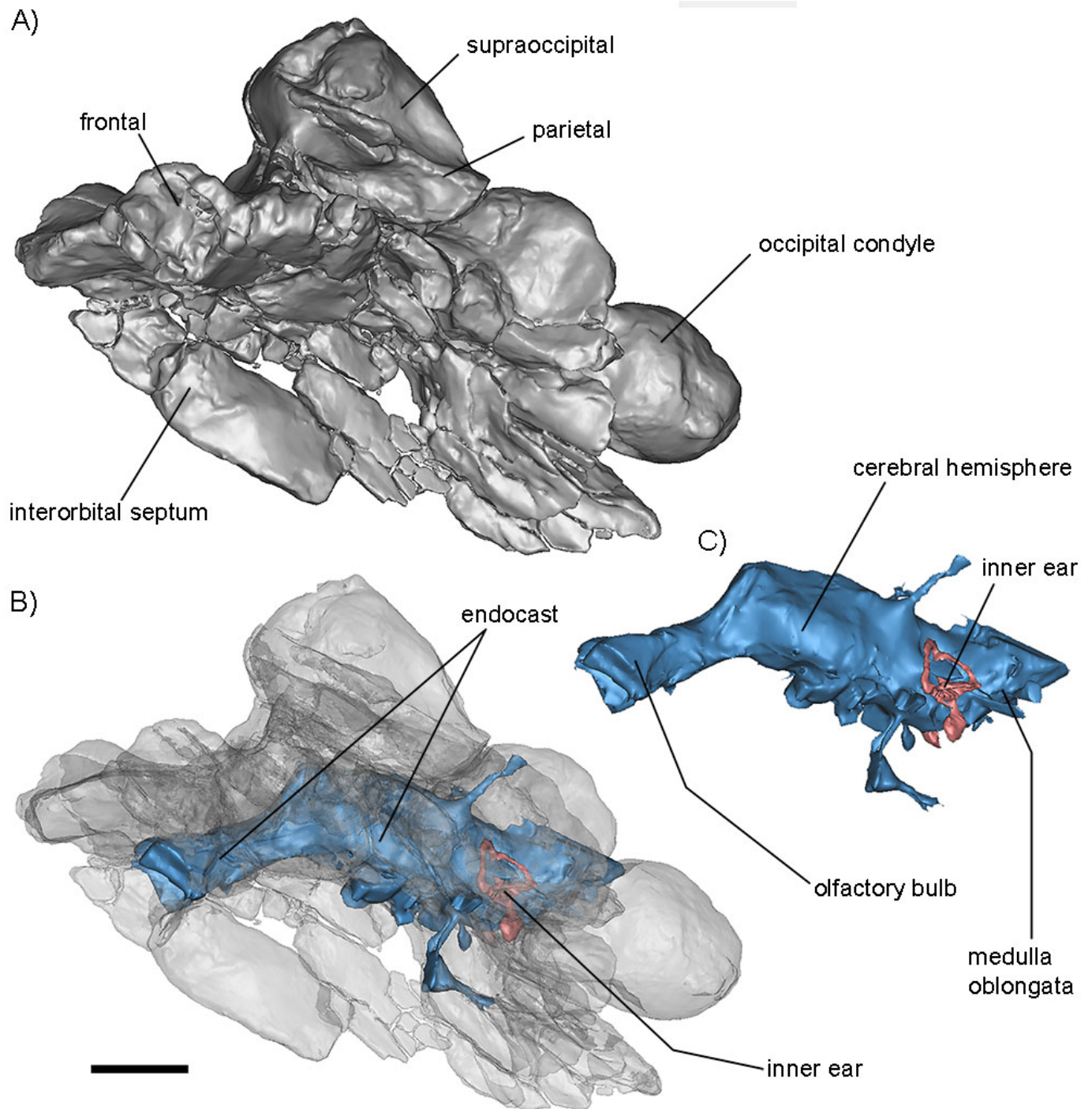


Figure 1. Braincase of the carcharodontosaurid theropod *Giganotosaurus carolinii* (MUCPv-CH-1; Museo Ernesto Bachman, El Chocón, Neuquén, Argentina) in lateral left view. A) Braincase, B) Braincase bones rendered semi-transparent to allow observation of the brain, C) Detail of the brain and left inner ear. Scale = 50 mm. Gray, braincase; light blue, cranial endocast; pink, inner ear.