

3D model related to the publication: Anatomy of the holotype of “*Probelesodon*” *kitchingi* revisited, a chiniquodontid cynodont (Synapsida, Probainognathia) from the early Late Triassic of southern Brazil

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Abstract

The present 3D Dataset contains the 3D model analyzed in the following publication: Carolina A. Hoffmann, A. G. Martinelli & M. B. Andrade. 2023. Anatomy of the holotype of “*Probelesodon*” *kitchingi* revisited, a chiniquodontid cynodont (Synapsida, Probainognathia) from the early Late Triassic of southern Brazil, Journal of Paleontology.

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Inv nr.	Taxon
MCP1600PV	<i>Probelesodon kitchingi</i>

Table 1. Related specimen. Collection: Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS).

INTRODUCTION

Chiniquodontidae is a family of non-mammaliaform probainognathian cynodonts with occurrence in the Middle to Late Triassic of Africa and South America (Abdala & Giannini, 2002; Martinelli et al., 2017; Mocke et al., 2020). The computed tomography (CT-scan) method was used to describe and revise the morphology of one of the best-preserved chiniquodontid specimens (MCP 1600 PV, holotype of “*Probelesodon*” *kitchingi*) from Brazil (Sá-Teixeira, 1982), which allowed the visualization of sutures and cranial foramina. A 3D model of the skull was generated, with each bone segmented in a different color (Fig. 1). The specimen was redescribed, revising the known morphological information, and improving available data. In addition, the taxonomical status of the specimen was discussed, as well as the synonymization of species within the family.

See Table 1 and Fig. 1.

METHODS

The CT-scan was performed at the Instituto do Cérebro, São Lucas Hospital (PUCRS, Brazil) using the medical scanner Pet CT Multislice 16d Discovery. The following parameters were used: resolution of 512x512 pixels, 0.625 mm between slices, 140kV and 380mA, resulting in 676 slices. The visualization of the CT-scan images, segmentation of each bone and the generation of the 3D models and the videos were performed using the software Avizo 7.1 Standard Edition. Each bone was manually selected with a different color, using the coronal view, in the ‘segmentation editor’. To generate the final 3D model of the

segmented bones, and save it in color and in .ply format, each bone was isolated e saved separately using the software Avizo 7.1 Standard Edition. The colors, then, were selected on the MorphoDig and saved in a colormap. Slightly differences in color may occur in comparison to the original paper images due to the manually selected colors performed in MorphoDig. The 3D surface models are provided in .ply format, and can therefore be opened with a wide range of freeware.

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BIBLIOGRAPHY

- Abdala, F., Giannini, N. P., 2002. Chiniquodontid cynodonts: systematic and morphometric considerations. *Palaeontology* 45, 1151–1170. <https://doi.org/10.1111/1475-4983.00280>
- Hoffmann, C. A., Martinelli, A. G., Andrade, M.B., 2023. Anatomy of the holotype of “*Probelesodon*” *kitchingi* revisited, a chiniquodontid cynodont (Synapsida, Probainognathia) from the early Late Triassic of southern Brazil, *Journal of Paleontology*.
- Martinelli, A. G., Kammerer, C. F., Melo, M. P., Neto, V. D. P., Ribeiro, A. M., Da-Rosa, A. A. S., Schultz, C. L.,

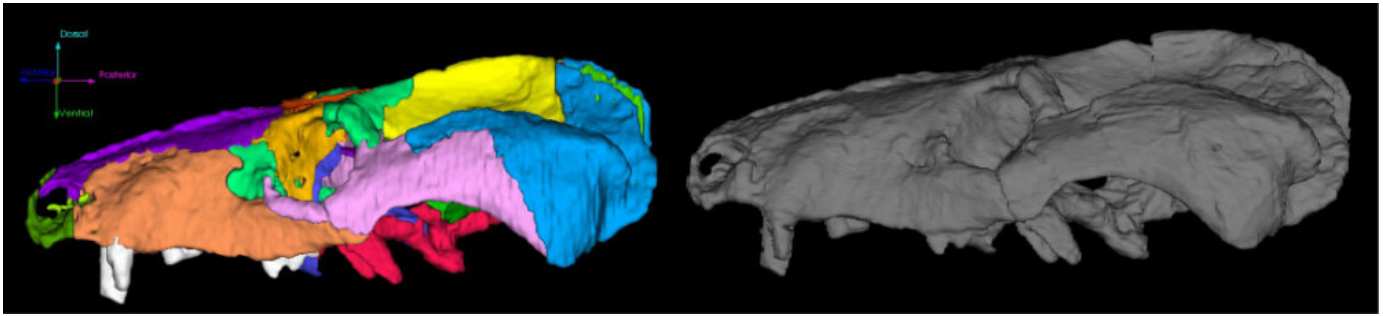


Figure 1. 3D models of the skull of MCP 1600 PV (“*Probelesodon*” *kitchingi*), with bones colored and segmented (left), and the surface without the segmentation (right), both in left lateral view.

Soares, M. B., 2017. The African cynodont *Aleodon* (Cynodontia, Probainognathia) in the Triassic of southern Brazil and its biostratigraphic significance. *PLoS ONE* 12, 1–54. <https://doi.org/10.1371/journal.pone.0177948>

Mocke, H. B, Gaetano, L. C., Abdala, F., 2020. A new species of the carnivorous cynodont *Chiniquodon* (Cynodontia, Chiniquodontidae) from the Namibian Triassic. *Journal of Vertebrate Paleontology* 39. <https://doi.org/10.1080/02724634.2019.1754231>

Sá-Teixeira, A. M., 1982. Um novo cinodonte carnívoro (*Probelesodon kitchingi* sp. nov.) do Triássico do Rio Grande do Sul, Brasil. *Comunicações do Museu de Ciências da PUCRS* 24, 1–31.