Dataset

3D model related to the publication: From limb to fin: an Eocene protocetid forelimb from Senegal sheds new light on the early locomotor evolution of early cetaceans.

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Abstract

The present 3D Dataset contains the 3D model analyzed in Vautrin et al. (2019), Palaeontology, From limb to fin: an Eocene protocetid forelimb from Senegal sheds new light on the early locomotor evolution of early cetaceans. https://doi.org/10.1111/pala.12442

Keywords: Cetacea, Eocene, Forelimb, Protocetidae, Senegal

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Inv. nr.	Description
SNTB2011-01	3D model of an articulated forelimb of a Carolinacetus-like protocetid from Senegal

Table 1. Corresponding specimen and model. SNTB2011-01 is stored in the collection of the department of geology of the University Cheikh Anta Diop in Dakar.

INTRODUCTION

We present here the 3D model of a cetacean specimen discovered in middle Eocene phosphate deposits from Taïba Ndiaye (Western Senegal), which enabled for the first detailed description of an articulated forelimb in a derived protocetid found outside Asia (Vautrin et al. 2019). SNTB2011-01 consists of bones of a single individual removed from a limestone block after acid preparation. It includes two nearly complete thoracic vertebrae, three ribs, a pedal phalanx, a patella, a fragment of a right humerus, a complete right ulna, a fragmentary right radius and a right autopod. Only the elements of the stylopod, zeugopod, and autopod are presented here. SNTB2011-01 is stored in the collection of the department of geology of the University Cheikh Anta Diop in Dakar.

METHODS

The bones of SNTB 2011-01 were imaged using a NextEngine 3-dimensional desktop scanner (NextEngine, Inc, Santa Monica, California) for the stylopod and zeugopod, and with high-resolution microtomography (µCT) at the MRI platform of the *Institut des Sciences de l'Evolution de Montpellier* (ISE-M) for the autopod. The 3D surfaces of the autopod elements were extracted semi-automatically with AVIZO 9.2 (FEI) using the segmentation threshold selection tool. 3D virtual restoration was performed with MorphoDig software (Lebrun 2018). The metacarpals III to V, the pyramidal, the lunar, the scaphoid, the unciform, the magnum, and the trapezoid were all found in anatomical connection and were left in their original position. The trapezium was moved and repositioned in articulation with the scaphoid. The metacarpal II was moved distally to articulate with the magnum. Following the reconstructions of *Maiacetus inuus*, *Rodhocetus kasranii*, and *Dorudon atrox* (Gingerich et al. 2001, 2009; Uhen 2004), the pisiform, the metacarpal I, and the proximal, medial and distal phalanges were repositioned in connection with other elements. The 3D surface model of the complete forelimb (Fig. 1 and table 1) is provided in .ply format, and can therefore be opened with a wide range of freeware.

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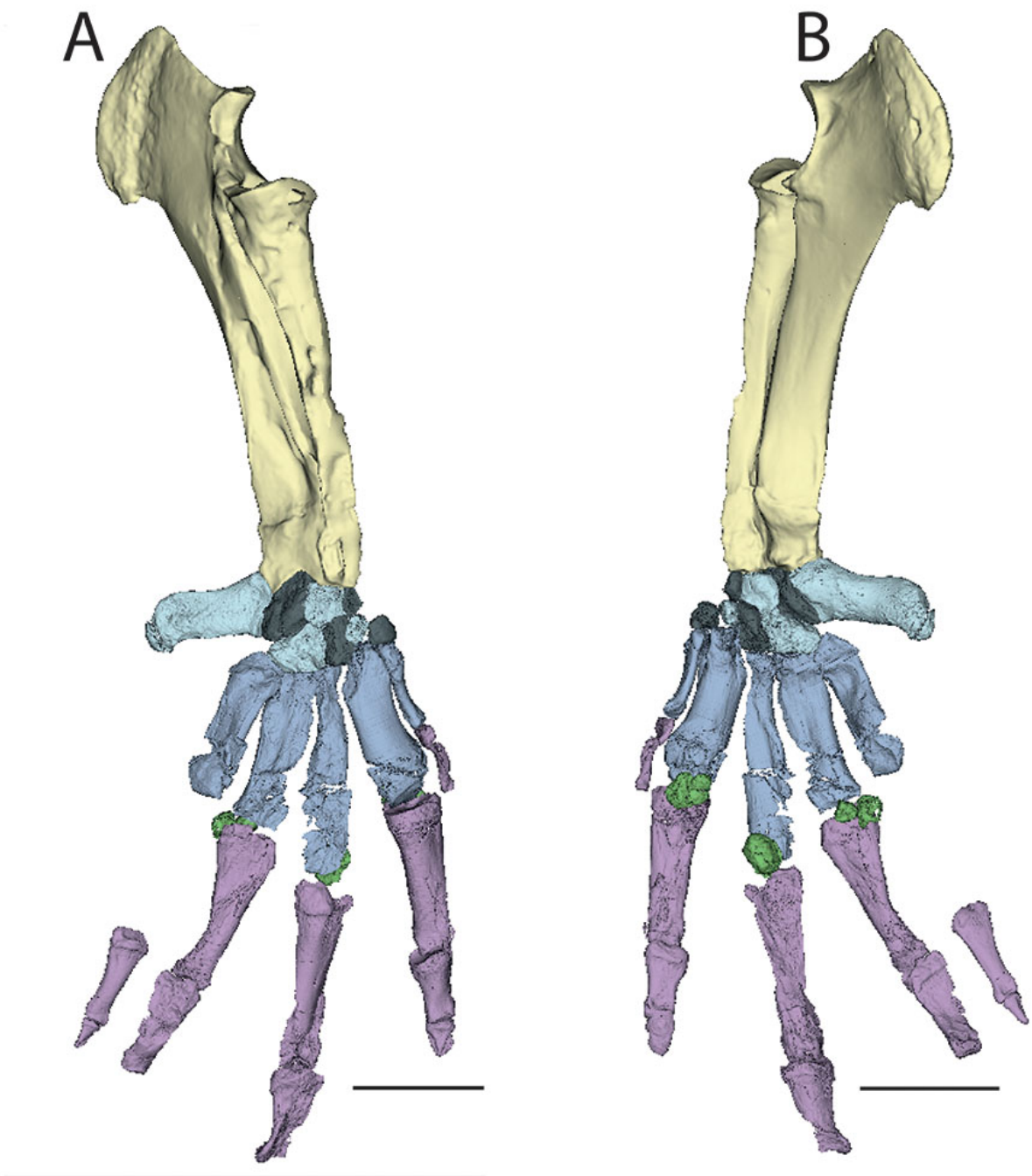

Figure 1. 3D reconstruction of the Senegalese right forelimb (SNTB 2011-01) in dorsal (A) and palmar (B) views. The zeugopod elements are coloured in yellow, carpals are in cyan, metacarpals in blue, phalanges in violet, and sesamoids in green. Scale bar: 5cm.

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