Dataset

3D models related to the publication: Evolutionary Adaptation to Aquatic Lifestyle in Extinct Sloths Can Lead to Systemic Alteration of Bone Structure.

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Abstract
The present 3D Dataset contains the 3D models analyzed in: Amson et al., Under review. Evolutionary Adaptation to Aquatic Lifestyle in Extinct Sloths Can Lead to Systemic Alteration of Bone Structure doi:10.1098/rspb.2018.0270.

Keywords: aquatic lifestyle, brain endocast, evolutionary adaptation, olfactory bulbs, *Thalassocnus*

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Inv. nr.	Taxon	Collection
MNHN-ZM-MO-1999-1065	*Bradypus tridactylus*	MNHN, Paris
MNHN-ZM-MO-1996-594	*Choloepus didactylus*	MNHN, Paris
MNHN-F-SAS-734	*Thalassocnus natans*	MNHN, Paris
MNHN-F-SAS-1610	*Thalassocnus littoralis*	MNHN, Paris
MNHN-F-SAS-1615	*Thalassocnus littoralis*	MNHN, Paris
SMNK-3814	*Thalassocnus carolomartini*	SMNK, Karlsruhe

Table 1. List of brain endocast 3D models

INTRODUCTION

In *Evolutionary Adaptation to Aquatic Lifestyle in Extinct Sloths Can Lead to Systemic Alteration of Bone Structure*, we present modifications of the endocranial structure accompanying the adaptation to the aquatic environment of the extinct sloth *Thalassocnus* (Neogene of western coast of South America). The skulls of the late (arguably more aquatic) species of this genus were found as pachyosteosclerotic, notably comprising pachyostotic ethmoturbinates. We interpret the latter as most likely functional in all sampled species, because the cribriform plate has conserved its configuration and because the olfactory bulbs are well developed across the whole dataset (see table 1). This was demonstrated using the ratio of both olfactory bulbs endocast volume to that of the whole brain endocast (Fig.1).

METHODS

Brain endocasts were segmented using Mimics (Materialize) or Avizo (FEI Visualization science group) software. Surface models were exported in STL format, and then converted to OBJ format using the software Meshlab (Cignoni et al. 2008). Geomagic Studio (3D Systems) was then used to clean the models, i.e, trimming of the spinal cord endocast and vessels and repairing of holes, in order to obtain a watertight model. Small portions of a fragmentary specimen (*T. carolomartini*, SMNK-3814) had to be completed as well. The 3D surface models are provided in .ply format, and can therefore be opened with a wide range of freeware.

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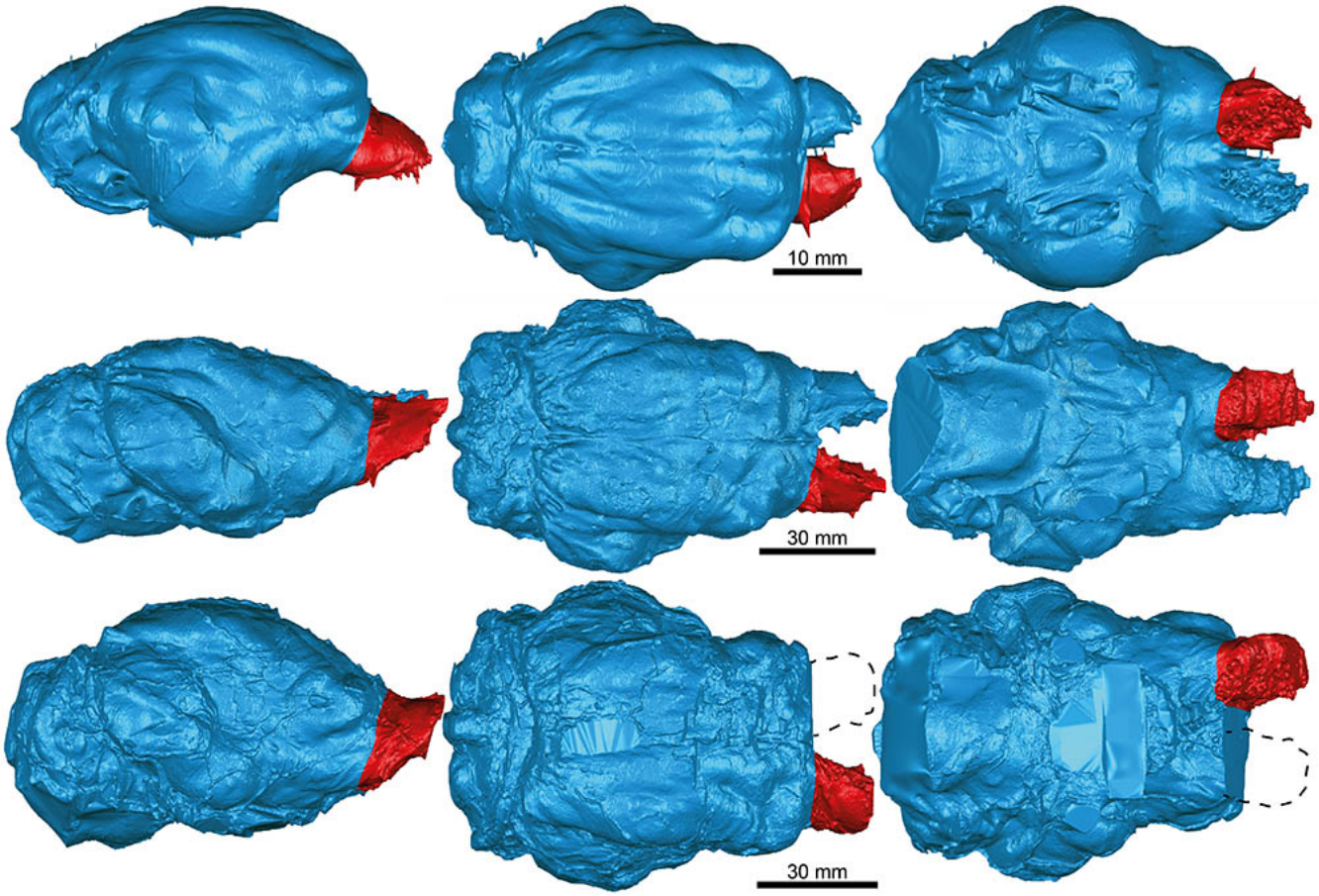

Figure 1. Brain endocast of an extant sloth and extinct (semi-)aquatic sloths *Thalassocnus* in right lateral (left), dorsal (middle), and ventral (right) views. The right olfactory bulb (as selected for the measurement) is highlighted in red. a) *Bradypus tridactylus* (MNHN-ZM-MO-1999-1065); b) *T. natans* (MNHN-F-SAS-734; postcranially non-pachyostotic and incipiently osteosclerotic); c) *T. carolomartini* (SMNK-3814, mirrored; postcranially strongly pachyosteosclerotic).

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