Dataset

# 3D models related to the publication: Reassessment of the enigmatic ruminant Miocene genus *Amphimoschus* Bourgeois, 1873 (Mammalia, Artiodactyla, Pecora)

Bastien Mennecart[1,2*], Grégoire Métais[3], Jérémy Tissier[4,5], Gertrud E. Rössner[6,7], Loïc Costeur[1]

[1] *Naturhistorisches Museum Basel, Basel, Switzerland, CH4001*
[2] *Naturhistorisches Museum Wien, Vienna, Austria, CH1010*
[3] *CR2P - Centre de Recherches sur la Paléobiodiversité et les Paléoenvironnements, Paris, France, FR75005*
[4] *Jurassica Museum, Porrentruy, Switzerland, CH2900*
[5] *University of Fribourg, Fribourg, Switzerland, CH1700*
[6] *Staatliche Naturwissenschaftliche Sammluntgen Bayerns - Bayerische Staatssammlung für Paläontologie und Geologie, Munich, Germany, GE80333*
[7] *Department für Geo- und Umweltwissenschaften, Ludwig-Maximilians-Universität München, Munich, Germany, GE80333*
*__Corresponding author__: mennecartbastien@gmail.com

**Abstract**
The present 3D Dataset contains the 3D models analyzed in Mennecart B., Métais G., Costeur L., Ginsburg L, and Rössner G.E. 2021. Reassessment of the enigmatic ruminant Miocene genus *Amphimoschus* Bourgeois, 1873 (Mammalia, Artiodactyla, Pecora). *PlosOne*. https://doi.org/10.1371/journal.pone.0244661

**Keywords:** Bony labyrinth, Miocene, Petrosal bone, Ruminant, Skull

Submitted:2020-09-14, published online:2021-02-01. https://doi.org/10.18563/journal.m3.131

| Inv nr. | Model nr. | Description |
|---|---|---|
| MNHN.F.AR3266 | M3#701 | Skull's cast surface scan |
| MNHN.F.AR3266 | M3#702 | Right petrosal bone and bony labyrinth |
| SMNS40693 | M3#704 | Left petrosal bone and bony labyrinth |

**Table 1.** Information related to the 3D models of *Amphimoschus ponteleviensis*' skull and ear region from Artenay (France) MNHN.F.AR3266 and Langenau 1 (Germany) SMNS40693. MNHN: Muséum National d'Histoire Naturelle, Paris, France. SMNS: Staatliches Museum für Naturkunde Stuttgart, Germany.

## INTRODUCTION

We describe the first skulls of *Amphimoschus ponteleviensis*, the type and currently only known species of this ruminant genus (Figure 1A). Endocranial structures (Bony labyrinth and petrosal bone) are studied and described (Figure 1B-C and Table 1). These structures are highly informative for phylogeny, especially highlighted in the history of ruminants (Aiglstorfer et al. 2017, Mennecart & Costeur 2016, Mennecart et al. 2016, 2017). Despite the abundant and well-preserved material, no firm phylogenetical conclusion can be drawn. Indeed, *Amphimoschus* possesses a mosaic of primitive and derived characters considering the dental elements and the bony labyrinth.

## METHODS

The specimens were scanned at the platform "Accès Scientifique à la Tomographie à Rayon X (AST-RX)" (GE Sensing and Inspection Technologies phoenix X-ray v—tome—x L240-180) in MNHN Paris (France) and at the Staatliche Naturwissenschaftliche Sammlungen Bayerns with a nanoCT® system nanotom® (phoenix X-ray, GE Sensing & Inspection Technologies) in Munich (Germany). The 3D surfaces of the petrosal bones and of the inner ear were extracted semi-automatically within AVIZO 9.0 using the segmentation threshold selection tool. The surface scans have been processed using an Artec Space Spider structured-light scanner and reconstructed with Artec Studio 10 Professional. All the 3D surface models are provided in .ply format, and can therefore be opened with a wide range of freeware. MNHN is the acronym for Museum National d'Histoire Naturelle de Paris (France) and SMNS is the acronym for Staatliches Museum für Naturkunde Stuttgart (Germany).

## ACKNOWLEDGEMENTS

Grant sponsor: Swiss National Science Foundation. Grant number: P300P2_161065. Grant sponsor: Swiss National Science Foundation. Grant number: P3P3P2_161066. Grant sponsor: Swiss National Science Foundation. Grant number: 200021_159854/1. Grant sponsor: Swiss National Science Foundation. Grant number: 200021-178853. Grant sponsor: German Research Foundation. Grant number: RO 1197/3-1. Grant sponsor: Museum National d'Histoire Naturelle de Paris. Grant number: Ast-RX-2013-051. We are very grateful to Renaud Lebrun with his help with the 3D data and the publication in MorphoMuseuM.

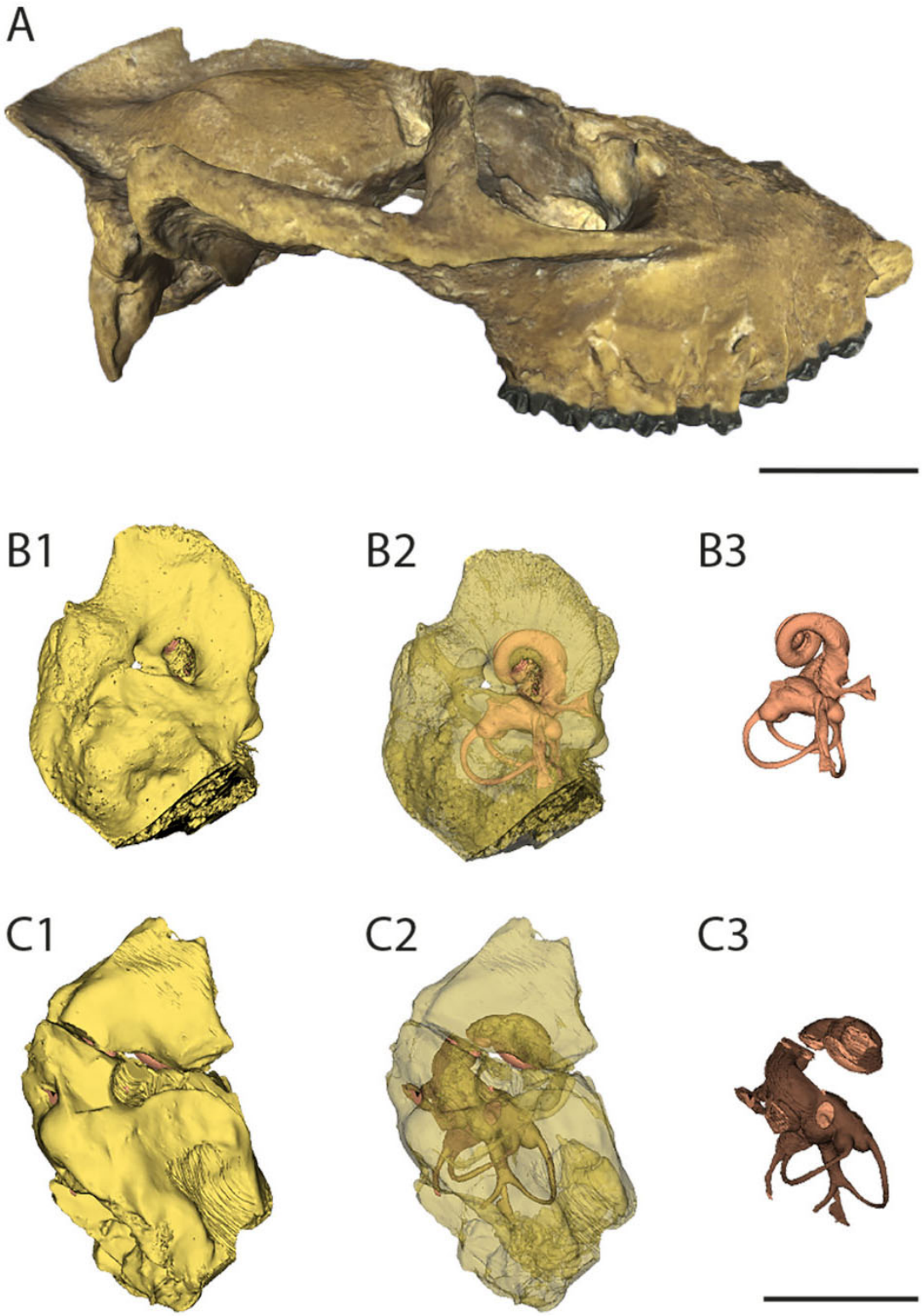


**Figure 1.** *Amphimoschus ponteleviensis* skull and ear region. MNHN.F.AR3266 (from Artenay, France): A surface scan of the skull in right lateral view, B1 right petrosal bone, B2 bony labyrinth observed through transparent petrosal bone, and B3 bony labyrinth; SMNS40693 (from Langenau 1, Germany): C1 left petrosal bone, C2 bony labyrinth observed through transparent petrosal bone, and C3 bony labyrinth. Petrosal bones and bony labyrinths are in dorsomedial view. Scale bare is 3 cm for A and 1 cm for B and C.


ISSN: 2274-0422

## BIBLIOGRAPHY

Aiglstorfer M., Costeur L., Mennecart B. & Heizmann E.P.J. 2017. *Micromeryx*? *eiselei* – a new moschid species from Steinheim am Albuch, Germany, and the first comprehensive description of moschid cranial material from the Miocene of Central Europe. PlosOne 12(10), e0185679. https://doi.org/10.1371/journal.pone.0185679

Mennecart B., Métais G., Costeur L., Ginsburg L. & Rössner G.E. 2021. Reassessment of the enigmatic ruminant Miocene genus *Amphimoschus* Bourgeois, 1873 (Mammalia, Artiodactyla, Pecora). PlosOne. https://doi.org/10.1371/journal.pone.0244661

Mennecart B., DeMiguel D., Bibi F., Rössner G.E., Métais G., Neenan J. M., Wang S., Schultz G., Müller B. & Costeur L. 2017. Bony labyrinth morphology clarifies the origin and evolution of deer. Scientific Reports 7, 13176. https://doi.org/10.1038/s41598-017-12848-9

Mennecart B., Rössner G.E., Métais G., DeMiguel D., Schultz G., Müller B. & Costeur L. 2016. The petrosal bone and bony labyrinth of Early to Middle Miocene European deer (Mammalia, Cervidae) reveal their phylogeny. Journal of Morphology 277, 1329–1338. https://doi.org/10.1002/jmor.20579

Mennecart B. & Costeur L. (2016). A *Dorcatherium* (Mammalia, Ruminantia, Middle Miocene) petrosal bone and the tragulid ear region. Journal of Vertebrate Paleontology 36(6), e1211665. https://doi.org/10.1080/02724634.2016.1211665

 ISSN: 2274-0422