Dataset

3D models related to the publication: New material of *Epiaceratherium* and a new species of *Mesaceratherium* clear up the phylogeny of the early Rhinocerotidae (Perissodactyla)

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Abstract
The present 3D Dataset contains two 3D models described in Tissier et al. 2020 (https://doi.org/10.1098/rsos.200633): the only known complete mandible of the early-branching rhinocerotoid *Epiaceratherium magnum* Uhlig, 1999, and a hypothetical reconstruction of the complete archetypic skull of *Epiaceratherium* Heissig, 1969, created by merging three cranial parts from three distinct *Epiaceratherium* species.

Keywords: *Epiaceratherium*, *Molassitherium*, Oligocene, Rhinocerotidae

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INTRODUCTION

The 3D models presented here have been described by Tissier et al. (in prep.). The mandible NMB.O.B.928 (Figure 1 and Table 1) assigned to *Epiaceratherium magnum* Uhlig, 1999 is housed in the Naturhistorisches Museum Basel (Switzerland). This is the most complete remain known to date attributed to this otherwise poorly known species. It notably shares the absence of third lower incisor and lower canine, the absence of lingual cingulum on the lower premolars and the usually-closed posterior valley on p2 with other species of the genus, i.e. *E. bolcense* Abel, 1910 and *E. naduongense* Böhme et al., 2013.

Figure 1. Mandible of the Oligocene rhinocerotid *Epiaceratherium magnum* Uhlig, 1999, from Rheinbetts, Switzerland (NMB.O.B.928). Scale bar = 10 cm.

The new combination *Epiaceratherium delemontense* (Becker and Antoine, 2013) has also been proposed after a new phylogenetic analysis (Tissier et al., in prep.) instead of *Molassitherium delemontense* Becker and Antoine, 2013. The generic assignment of this species has deep implications on its supposed anterior dentition because the anterior part of the type skull MJSN POI007–245 of *E. delemontense* is incompletely preserved and its anterior dentition is unknown. Thus, as a representative of *Epiaceratherium* Abel, 1910, we infer that it possessed a complete set of upper anterior teeth, i.e. three pairs of incisors and one pair of canines, which is typical of earliest-branching Rhinocerotidae but incompatible with the original attribution to the more derived rhinocerotid *Molassitherium* Becker and Antoine, 2013. Therefore, we propose here a hypothetical reconstruction of the archetypal skull of *Epiaceratherium*, illustrating this plesiomorphic anterior dentition (Figure 2 and Table 1).

Model Id	Description
M3#534	Mandible of *Epiaceratherium magnum* (NMB.O.B.928) with texture file.
M3#535	Archetypal reconstruction of the skull of *Epiaceratherium*, generated by 3D virtual association of the cranium of *E. delemontense* (MJSN POI007–245), mandible of *E. magnum* (NMB.O.B.928) and snout of *E. bolcense* (NMB.I.O.43).

Table 1. List of models. NMB: Naturhistorisches Museum Basel. MJSN: Musée jurassien des sciences naturelles, or Jurassica Museum.

METHODS

The specimens have been surface-scanned with a structured-light scanner (Artec Space Spider) and reconstructed with Artec Studio 10 Professional. The 3D surface models are provided in .ply format and can be visualized with a wide range of freeware, such as MeshLab or MorphoDig. The specimen NMB.O.B.928

can be visualized either with or without texture. The archetypic skull of *Epiaceratherium* was generated by virtually associating in Meshlab (v2016.12) the mandible NMB.O.B.928 of *Epiaceratherium magnum* to the holotype skull of *Epiaceratherium delemontense* (specimen number MJSN POI007–245; 3D model available in Maridet et al. 2019) as well as part of the snout of *E. bolcense* (NMB.I.O.43, described by Dal Piaz, 1930). This latter specimen only comprises the right side and was thus duplicated and reversed to fit the left side of the skull MJSN POI007–245. The Meshlab function "Flip X-axis" (without matrix freezing) from the "Filters → Normals, Curvatures and Orientation" menu was used to reverse it. They were then rotated and translated to fit the skull MJSN POI007–245, and the teeth as well as the maxillary foramen were used to associate them in an anatomically correct position. The nasal part of the snout of *E. bolcense* as well as the poorly preserved premaxillary part of the skull MJSN POI007–245 was "erased" using the command "Delete selected vertices", for esthetic purposes. The mandible NMB.O.B.928 was also rotated and translated, using the last molars and the mandibular condyles position as calibrations to anatomically fit the skull of *E. delemontense*. All visible layers were then flattened to create a single mesh and colors were applied using the "Z-painting" tool on each part to differentiate each specimen. We emphasize that this hypothetical skull is purely theoretical and does not have any anatomical value and should only be used as an archetypal representation of *Epiaceratherium*.

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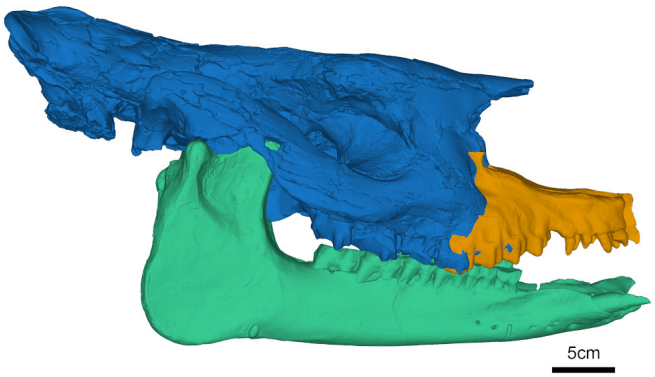

Figure 2. Archetypal reconstruction of the skull of the Oligocene rhinocerotid *Epiaceratherium* Abel, 1910, generated by 3D virtual association of the cranium of *E. delemontense* (Becker and Antoine, 2013), mandible of *E. magnum* Uhlig, 1999 and snout of *E. bolcense* Dal Piaz, 1930.

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