Dataset

3D models related to the publication:The petrosal and bony labyrinth of *Diplobune minor*, an enigmatic Artiodactyla from the Oligocene of Western Europe

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Abstract
This contribution contains the 3D models described and figured in the publication entitled "The petrosal and bony labyrinth of *Diplobune minor*, an enigmatic Artiodactyla from the Oligocene of Western Europe" by Orliac, Araújo, and Lihoreau published in Journal of Morphology (Orliac et al. 2017). https://doi.org/10.1002/jmor.20702

Keywords: Anoplotheriidae, bony labyrinth, Quercy Phosphorites

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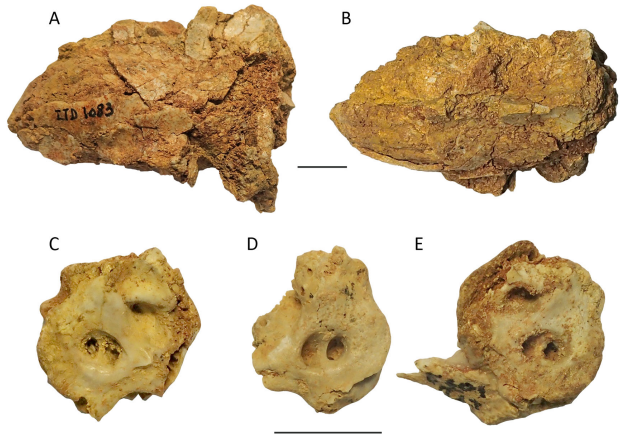

Figure 1. Illustration of the physical specimens of *Diplobune minor* from Itardies from which the 3D models derive: A-B partial cranium UM ITD 1083 in A, lateral and B, dorsal views; C, isolated petrosal UM ITD 1080; D, isolated petrosal UM ITD 1081; E, isolated petrosal UM ITD 1079. Scale bars = 2 cm.

INTRODUCTION

The 3D models presented here document isolated petrosals and their internal structures referred to *Diplobune minor* from the Early Oligocene locality of Itardies (Quercy, France) and described by Orliac et al. (2017). This material provide new data on petrosal and bony labyrinth anatomy for early artiodactyls (see Table 1 and Fig. 1). It also brings new elements to discuss the ecology of this enigmatic extinct taxon, reconstructed as semi-aquatic (Gervais, 1850), or partly arboreal/partly ground-dwelling (Sudre, 1982). The innervation and vasculature of the inner ear is also reconstructed for the first time for an extinct artiodactyl. The petrosal of *D. minor* exhibits several plesiomorphic characters like the presence of a transpromontorial and stapedial sulci, and of a tegmen tympani canal. But it also presents some peculiar features such as a deep fossa of unknown morphological function anterior to the aqueduct cochleae, a large caudal tympanic process bearing imprint of the transpromontorial sulcus, and no extension of the secondary bony lamina on the cochlear canal. From a functional point of view, the petrosals of *Diplobune minor* present a large mastoid process and their tegmen tympani is not pachyostotic, two characters that do not support underwater hearing, leading Orliac et al. (2017) to conclude that this taxon was not semi-aquatic.

METHODS

The 3D surfaces of the isolated petrosals were extracted semi-automatically within AVIZO 9.0 (Visualization Sciences Group) using the segmentation threshold selection tool. The *in situ* petrosal UM ITD 1083 was extracted slice-by-slice manually with the limited range only option of the brush tool of AVIZO 9.0. We virtually extracted the endocasts of the bony labyrinth, blood vessel canals, and nerve pathways using the segmentation tools of AVIZO 9.0; the segmentation process was performed slice-by-slice manually with the limited range only option of the brush tool. The 3D surface models are provided in ply format, and can therefore be opened with a wide range of freeware. Additional flag files specific to ISEMeshTools (Lebrun, 2014) are provided in order to visualize the 3D labelled models in standard orientation. Additional information regarding parameters of the CT scan data from which the models derive are provided in supplementary material.

Model IDs	µCT voxel size	Description
M3#138_UMI TD1079	36µm	right bony labyrinth
M3#139_UMI TD1079	36µm	right isolated petrosal
M3#140_UMI TD1080	36µm	left bony labyrinth
M3#141_UMI TD1080	36µm	left isolated petrosal
M3#142_UMI TD1081	18µm	right bony labyrinth and associated nerves and veins
M3#143_UMI TD1081	18µm	right isolated petrosal
M3#144_UMI TD1083	36µm	left bony labyrinth
M3#145_UMI TD1083	36µm	left petrosal

Table 1. List of associated models of *Diplobune minor* and CT scan parameters. All models stand as labeled three-dimensional reconstructions.

ACKNOWLEDGEMENTS

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