Dataset

3D models related to the publication: The endocranial cast of *Khirtharia* (Artiodactyla, Raoellidae) provides new insights into the earliest evolution of the cetacean brain

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Abstract

The present 3D dataset contains 3D models of the endocranial cast of the raoellid *Khirtharia inflata* retrieved from the middle Eocene of the Upper Subathu Formation in the Kalakot area (India). Raoellidae are closely related to stem cetaceans and bring crucial information to understand the earliest phase of land to water transition in Cetacea.

Keywords: brain, Cetacea, India, Middle Eocene

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Inv nr.	Description
M3#1608	Labeled cast of the endocranial cavity
M3#1609	Endocast and associated sinuses

Table 1. List of models of GU/RJ/197 (*Khirtharia inflata*). Collection: Garhwal University, Srinagar 246175 Uttaranchal, India.

INTRODUCTION

Raoellidae are small artiodactyls retrieved from the middle Eocene of Asia (ca - 47 Ma) and closely related to stem Cetacea. Their endocranial structures allow for understanding some of the early steps of the evolutionary history of the brain of Cetacea. Waqas et al. (in press) investigate the internal structures of an exceptionally well-preserved cranium referred to the species *Khirtharia inflata* collected from the Kalakot area (Jammu and Kashmir, India; Waqas et al. 2024). Micro-CT scan investigation and virtual reconstruction of the endocast and associated sinuses (see Table 1 and Fig. 1) provide crucial additional morphological data as well as reliable measurements (linear, surfaces, and volumes). This study shows that, like described for *Indohyus indirae* by Orliac and Thewissen (2021), the brain of *K. inflata* exhibits together a mosaic of features observed in earliest artiodactyls and unique derived characters present in stem cetaceans. The volume of the brain relative to body mass of *Khirtharia inflata* is markedly smaller than that of other early artiodactyls, which is probably a side effect of the adaptation to aquatic life.

METHODS

In this work we describe the endocast of the specimen GU/RJ/197 attributed to *Khirtharia inflata* described by Waqas et al. (2024) from the middle Eocene locality of Aiji 2 (Subathu Group of the Kalakot region, northwest Himalaya of Rajouri district, Jammu and Kashmir). The specimen is housed in the collections of the Paleontology lab of Garhwal University, India. The 3D data acquisition was performed at the µCT scanner facility of the Montpellier Rio Imaging platform (MRI) at the University of Montpellier, using a RX Solutions EasyTom 150 µCT scanner, with a voxel size of 69.45 µm. Segmentation was performed manually slice by slice using the pencil segmentation tool of the software Avizo ® 9.3 (Thermo Fisher Scientific-FEI). The endocast and sinuses were segmented separately on different label fields.

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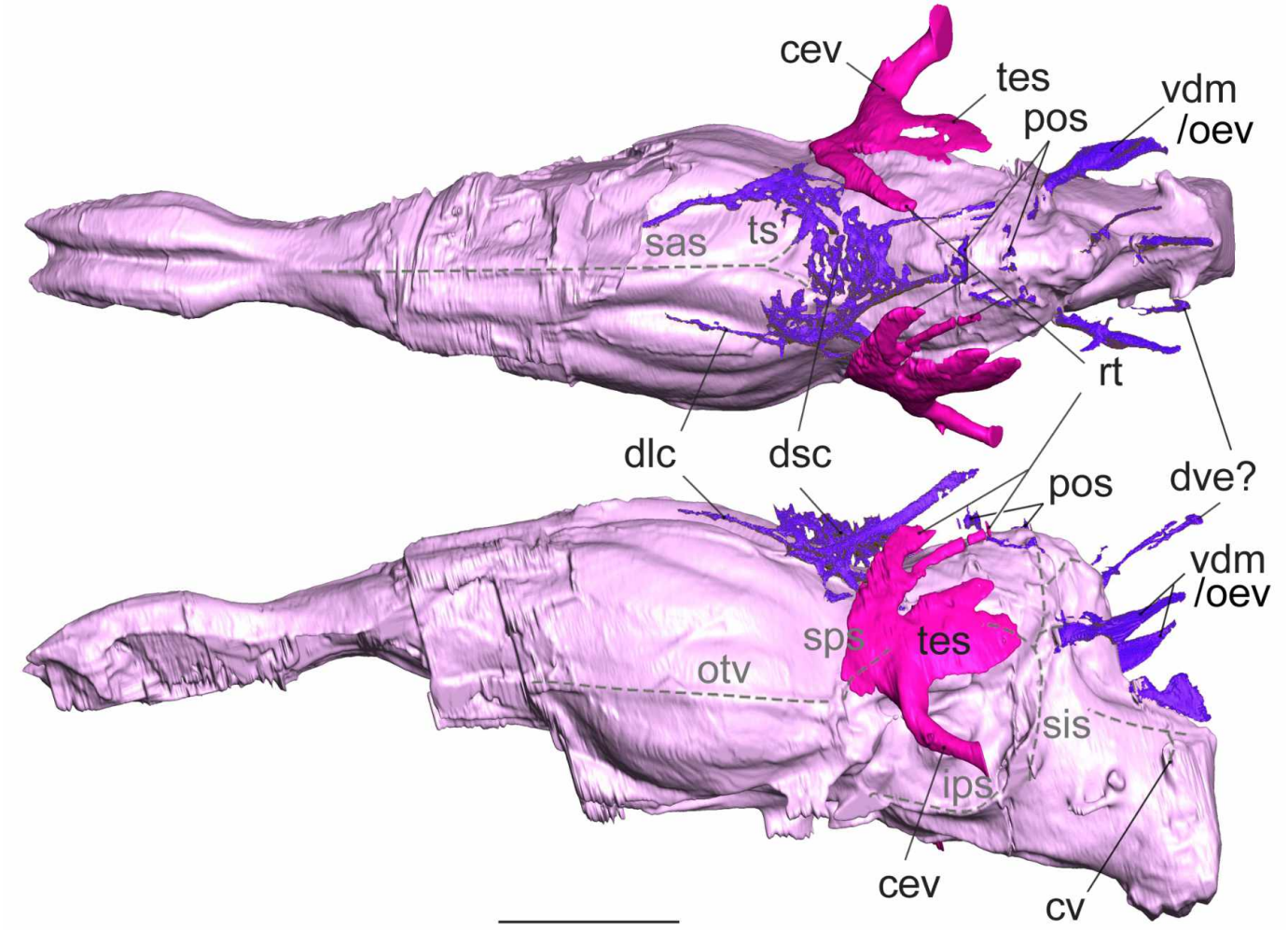

Figure 1. Labelled 3D model of the endocranial cast and associated sinuses of *Khirtharia inflata* (GU/RJ/197) in a), dorsal; b), lateral. Abbreviations: cev, canal for capsuloparietal emissary vein; cv, condyloid vein; dlc, dorsolateral canal; dsc, dorsal confluence of sinuses; dsce, dorsal sinus canal exit; dve, diploic vein emissary; dvef, diploic vein emissary foramen; ips, inferior petrosal sinus; mf, mastoid foramen; oev, occipital emissary vein; otv orbitotemporal vein; pgf, postglenoid foramen; pos posterior occipital sinus; rt, rami temporale; sas, sagittal sinus; sis, sigmoid sinus; sps, superior petrosal sinus; tes, temporal sinus; tf, temporal fomamen; vc, vascular canal; vdm vein diploetica magna. Scale bars = 10 mm.

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