3D models related to the publication: Euclastidae n. fam. (Chelonioidea) et première mention d'*Euclastes* Cope, 1867 dans le Paléocène du bassin de Paris (France)

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Abstract

The 3D dataset presented in this article provides the 3D models of two Chelonioidea turtles dentaries from the Paleocene of France described in: Lapparent de Broin F. de, Marek H., Barrier P. & Gagnaison C. 2025. Euclastidae n. fam. (Chelonioidea) et première mention d'*Euclastes* Cope, 1867 dans le Paléocène du bassin de Paris (France). *Geodiversitas* 47 (10): 409-464. https://doi.org/10.5252/geodiversitas2025v47a10.

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INTRODUCTION

Here are presented the 3D models of two dentaries (Fig. 1 ; Table 1) belonging to Chelonioid turtles, genus *Euclastes*, from the Paleocene of the Paris basin. The older one is Danian in age and was found at the historic Danian co-stratotype of Laversines (Beauvais area, Oise department) (Desor, 1847; Montenat & Merle, 2018). The second is from the Thanetian sands of the Bracheux Formation from the neighboring locality of Therdonne. The Danian dentary has been identified as an *Euclastes wielandi* (Hay, 1908), which was originally described based on materials from the Danian of New Jersey (USA). It is here the oldest reported occurrence of this genus in Europe. The Thanetian dentary has been classified as a new species: *Euclastes montenati* Lapparent de Broin et al., 2025, a smaller and more massive species characterized by a shorter and wider symphysis. The description of the two specimens has allowed for a new diagnosis and the renaming of the family as Euclastesidae in place of Osteopyginae. A family that is made specific by the presence of a secondary palate. This group also includes the genus *Erquelinnesia* (Dollo, 1887), that was the only Euclastesidae previously known from the Franco-Belgian basin before the description of the two *Euclastes* specimens. Stratigraphic and paleoenvironmental works have shown that the two *Euclastes* species are found in littoral environments, while *Erquelinnesia* is characteristic of more frankly marine settings. These two fossils testify of the distribution and ecological habits of Chelonioid turtles during the Paleocene.

METHODS

The two original fossils are preserved in the UniLaSalle (Beauvais, France) paleontological collection: ULB-04A21-10 of *Euclastes wielandi* and ULB-04A21-11 of *Euclastes montenati* nov. sp. A resin cast was produced for each of the two dentaries and sent to the Muséum national d'Histoire naturelle (Paris): MNHN.F.BPT52 of *Euclastes wielandi* and MNHN.F.BPT53 of *Euclastes montenati* nov. sp. (see Fig. 1 and Table 1). Two sets of 3D models have been created. The first set was generated based on the original fossils by the authors using Structure-from-Motion (SfM) photogrammetry with optical images. The SfM method is inexpensive, cost-effective (Westoby *et al.* 2012), and flexible, which is crucial given the small size of the models (most are less than 5 cm in length). It also gives the possibility to add textures and realistic colors to 3D models. The images were captured with a Canon EOS SP camera, equipped with a 60 mm focal distance macro lens, using manual focus under artificial lighting. Over one hundred images were taken from various angles for each model (Table 1). The models were then processed using the Agisoft Metashape software (copyright 2007 Free Software Foundation, Inc.), using high resolution parameters for photo alignment and medium parameters for dense cloud construction and mesh building. Manual removal of certain points was necessary in all models to ensure the highest possible rendering quality. To avoid blurry areas in the textures, some images were excluded from the texture computation, although they were used for cloud building. The image acquisition and processing were conducted at the Apex at UniLaSalle, an innovation center dedicated to the application of digital technologies in the fields of planetary and life sciences, engineering and biomimetics, and pedagogical design. The second set of 3D

Inv nr.	Taxon	Description	Collection
ULB-04A21-10	*Euclastes wielandi*	Dentary	UniLasalle, Beauvais, France
MNHN.F.BPT52	*Euclastes wielandi*	Dentary (cast of ULB-04A21-10)	MNHN, Paris
ULB-04A21-11	*Euclastes wielandi* nov. sp.	Dentary	UniLasalle, Beauvais, France
MNHN.F.BPT53	*Euclastes wielandi* nov. sp.	Dentary (cast of ULB-04A21-11)	MNHN, Paris

Table 1. List of models of specimens of *Euclastes* belonging to Paleocene turtles of the genus Euclastes from the Paris Basin.

models consists of surface scans realized by Florent Goussard and Nathalie Poulet-Crovisier (CR2P, Centre de Recherches sur la Paléobiodiversité et les Paléoenvironnements, MNHN, Paris). They were realized based on the casts using an Artec MICRO scanner (cofounded by CR2P and UMR 7209). This method produced more precises surfaces, enabling a better study of the anatomical details. It is complementary to the photogrammetric method that heavily rely on the photo's quality (sharpness, light) and that can hide details due colours and patterns on the object. Scans are also not affected by the object's reflectiveness and surface texture.

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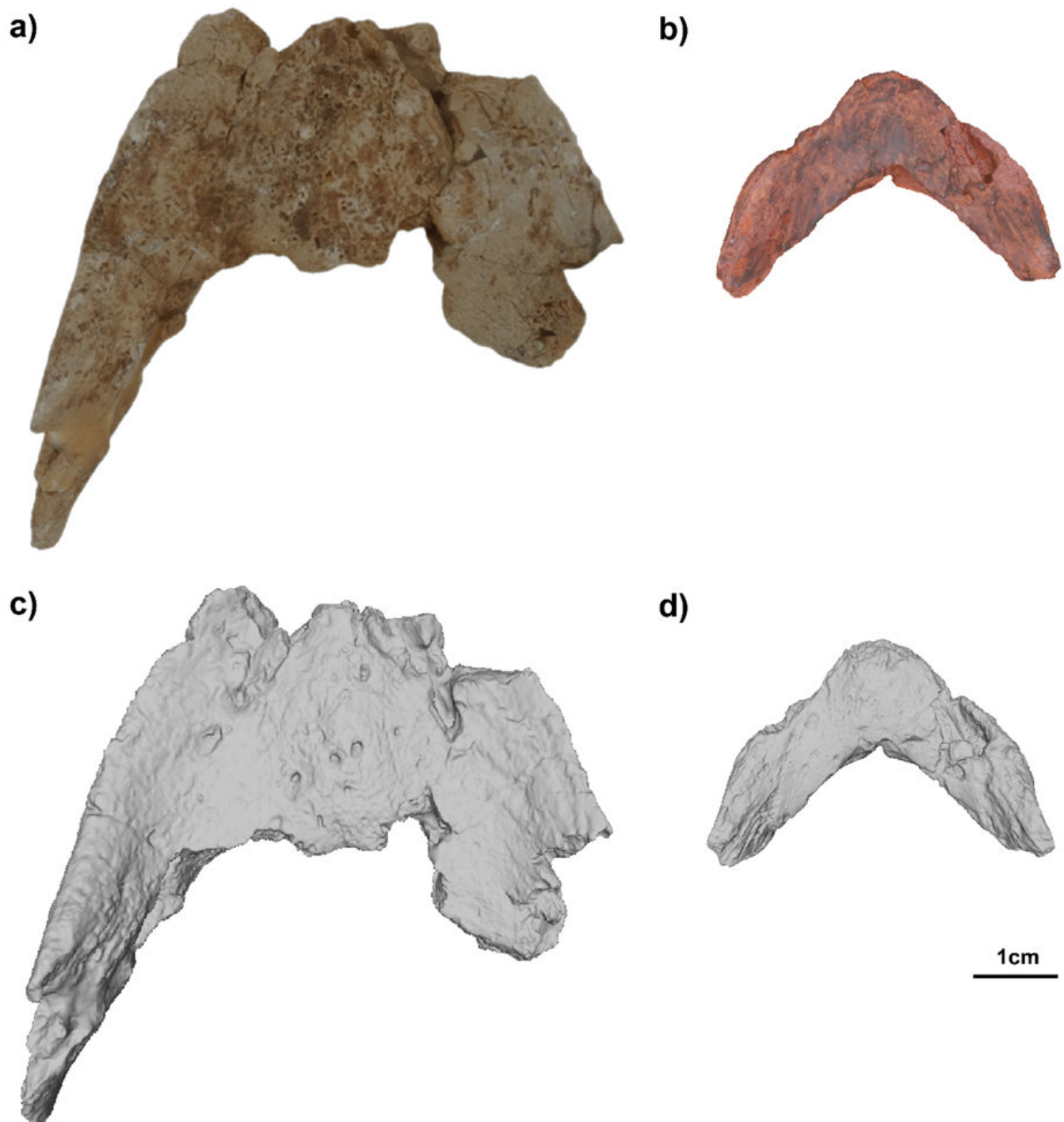
Figure 1. Three dimensional models of two partial dentaries belonging to Paleocene turtles of the genus *Euclastes* from the Paris Basin. a-b) 3D models of the original specimens ULB-04A21-10 of *Euclastes wielandi* (a) and ULB-04A21-11 of *Euclastes montenati* nov. sp. (b) realized with the photogrammetric method. c-d) Surface scans of the corresponding casts MNHN.F.BPT52 of *Euclastes wielandi* (c) and MNHN.F.BPT53 of *Euclastes montenati* nov. sp. (d)