

3D models related to the publication : Nouvelles données géologiques et biostratigraphiques du gisement paléontologique à vertébrés de Mauvières, à Marcilly-sur-Maulne (Miocène Inférieur et Moyen ; Indre-et-Loire, France)

Alexandre Robert-Duarte^{1*}, Cyril Gagnaison^{1*}, Bastien Mennecart^{1,2}, Réjanne Le Bivic¹, Maxime Denis¹

¹ Institut Polytechnique UniLaSalle Beauvais, Département Géosciences, GeNumEr, 19 rue Pierre Waguet – boîte postale 30313, F-60026 Beauvais cedex (France).

² Muséum d'Orléans pour la Biodiversité et l'Environnement, 6 rue Marcel Proust, F-45000 Orléans (FRANCE)

*Corresponding authors: alexandre.robertduarte@etu.unilasalle.fr, cyril.gagnaison@unilasalle.fr

Abstract

The present 3D Dataset contains 3D models (1 turtle and 7 mammals) from the french Lower Miocene described in: Gagnaison C., Mennecart B., Bailleul J., Barrier P., Chenot É., Toullec R., Potel S., Martin H., Millet A. & Memeteau D. 2023. — Nouvelles données géologiques et biostratigraphiques du gisement paléontologique à vertébrés de Mauvières, à Marcilly-sur-Maulne (Miocène inférieur et moyen ; Indre-et-Loire, France). *Geodiversitas* 45 (16): 449-478. <https://doi.org/10.5252/geodiversitas2023v45a16>.

Keywords: lower jaw, Lower jaw, Lower Miocene, mammals, tooth., turtle

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INTRODUCTION

The locality of Mauvières, Marcilly-sur-Maulne (Indre-et-Loire, France) is located in the South-West part of the Paris Basin, 55 kilometers North-West of the city of Tours. This site is a quarry that is periodically exploited for Miocene sands and shelly sands. In 2000, L. Ginsburg and his collaborators identified a rich fauna of continental vertebrates from the Early Orléanian (=Early-Middle Burdigalian) (Ginsburg *et al.*, 2000), approximately 19.22 My (Monchal *et al.* 2025), corresponding to the MN3 biozone European Land Mammal Age [ELMA]). The assemblage of this MN3 in the Mauvières site is composed of 53 taxas including the 32 taxas described by L. Ginsburg and his collaborators (Ginsburg *et al.*, 2000). In this work, we created surface models of 8 specimens (3 casts and 5 original specimens) from the collections of the Institut Polytechnique UniLaSalle Beauvais. The Mauvières paleontological site contains unique geological, paleontological and taphonomic data for this period and this regional context. This is why the aim of this study is to include this vertebrate paleontological site to the French national inventory of the important geological sites to be preserved (project launched by the Paris Museum). Among the specimens (Figure 1) made available there are: one nuchal plates of the turtle *Testudo promarginata* (Reinach, 1900) (ULB-MAUV-5); two carnivorous mammals, one right I1 of *Megamphicyon carnutense* (Antunes & Ginsburg, 1977) (ULB-MAUV-16), a cast of a maxilla with M1-2 related to *Hemicyon gargan* (Ginsburg & Morales, 1998) (ULB-MAUV-18); a third metacarpal of the Rhinocerotidae *Plesiaceratherium* sp (ULB-MAUV-20); Two samples of the Anthracotheriidae *Brachyodus intermedius* (Mayet, 1908): the second phalange of the lateral finger (III or IV) (ULB-MAUV-21) and a cast of a

right M3 (ULB-MAUV-31); and two specimens of *Ligeromeryx praestans* (Stehlin, 1937): a right lower jaw with p3-m1 (ULB-MAUV-24) and the cast of an antler (ULB-MAUV-25). Making these specimens available will facilitate the highlighting of this paleontological heritage for educational purposes and future research.

METHODS

The models were generated 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). The images were captured with a Canon EOS SP camera, equipped with a 50mm lens under artificial lighting. Approximately 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.

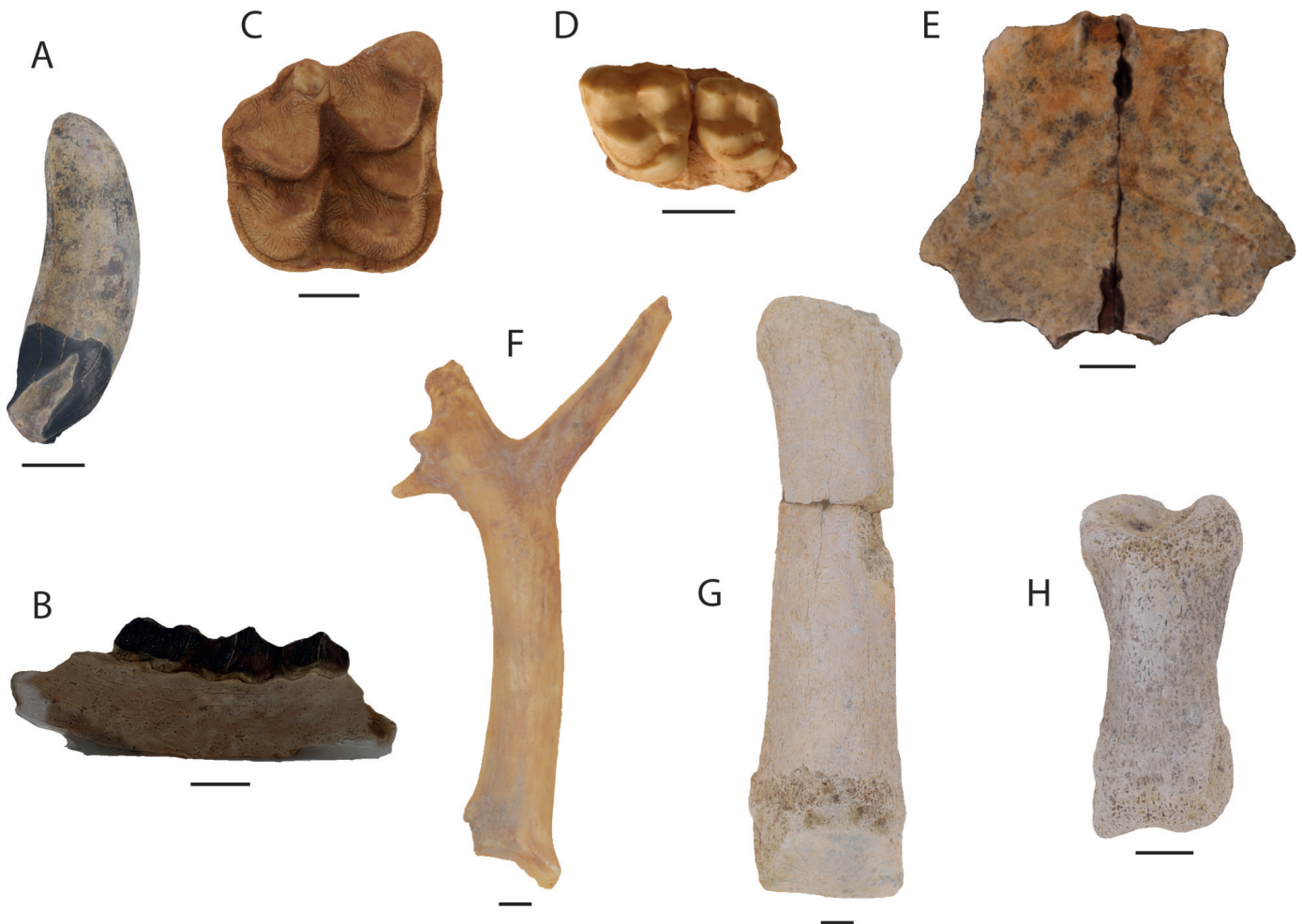


Figure 1. Casts and fossils of specimens from Mauvières, Marcilly-sur-Maulne (Indre-et-Loire, France). A, *Megamphicyon carnutense* (ULB-MAUV-16): right I1. B, *Ligeromeryx praestans* (ULB-MAUV-24): right lower jaw bearing p3-m1. C, *Brachyodus intermedius* (ULB-MAUV-31): cast of the right M3. D, *Hemicyon gargan* (ULB-MAUV-18): cast of a left maxilla bearing M1-2. E, *Testudo promarginata* (ULB-MAUV-5): nuchal plate. F, *Ligeromeryx praestans* (ULB-MAUV-25): cast of the right antler. G, *Plesiaceratherium* sp. (ULB-MAUV-20): right metacarpus III. H, *Brachyodus intermedius* (ULB-MAUV-21): phalanx II of the lateral finger (III or IV). Scale bars = 1 cm.

Inv nr.	Taxon	Description	Pictures number	Maximal length
ULB-MAUV-5	<i>Testudo promarginata</i>	nuchal plate	120	67.2
ULB-MAUV-16	<i>Megamphicyon carnutense</i>	right I1	96	53.0
ULB-MAUV-18	<i>Hemicyon gargan</i>	cast of a left maxilla bearing M1-2	27	30.0
ULB-MAUV-20	<i>Plesiaceratherium</i> sp.	right metacarpus III	96	195.0
ULB-MAUV-21	<i>Brachyodus intermedius</i>	phalanx II of the lateral finger (III or IV)	120	59.5
ULB-MAUV-24	<i>Ligeromeryx praestans</i>	right lower jaw bearing p3-m1	156	55.0
ULB-MAUV-25	<i>Ligeromeryx praestans</i>	cast of the right antler	120	155.0
ULB-MAUV-31	<i>Brachyodus intermedius</i>	cast of the right M3	108	36.5

Table 1. Specimen list. Collection: UniLaSalle, Beauvais, France. Locality : Mauvières, Marcilly-sur-Maulne (Indre-et-Loire, France). Age: Lower Miocene (-19,22 ± 0,79 Mya) Stratigraphical distribution: Orleanian sands Formation (MN3 biozone).

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