Annales de Paléontologie xxx (2018) xxx–xxx

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Original article

Rhinocerotidae (Mammalia, Perissodactyla) from the latest Oligocene Thézels locality, SW France, with a special emphasis on *Mesaceratherium gaimersheimense* Heissig, 1969

Rhinocerotidae (Mammalia, Perissodactyla) de l'Oligocène terminal de Thézels, Lot, avec un accent particulier sur Mesaceratherium gaimersheimense Heissig, 1969

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ARTICLE INFO

Article history:
Received 28 February 2018
Accepted 25 May 2018
Available online xxx

Keywords:
Mesaceratherium gaimersheimense
Diaceratherium aff. *lemanense*
Oligocene-Miocene transition
Comparative anatomy
Biochronology

ABSTRACT

A taxonomic revision of the Rhinocerotidae from the latest Oligocene locality of Thézels in SW France is provided, based on comparative description of several hundreds of mandibular, dental, and postcranial specimens. In terms of abundance, the small-sized and slender-limbed rhinocerotine *Mesaceratherium gaimersheimense* Heissig, 1969 widely outnumbers the medium-sized and shorter-limbed teleoceratine *Diaceratherium* aff. *lemanense*. The material from Thézels in particular adds to the knowledge of *M. gaimersheimense* in providing for the first time valuable information on most elements of its appendicular skeleton, virtually unknown thus far. This work further confirms that *M. gaimersheimense* is restricted to the latest Oligocene interval, whereas *M. paulhiacense* (Richard, 1937) also first occurring in latest Oligocene deposits, survives during the earliest Miocene (Aquitanian standard age; Agenian European Land Mammal Age). The Agen area in SW France (type area of the Agenian ELMA) provides a well-documented sequence for latest Oligocene-earliest Miocene rhinocerotids of Western Europe with Thézels (MP30), Paulhiac (MN1), and Laugnac (MN2). *Mesaceratherium gaimersheimense* shows several postcranial differences with *M. paulhiacense* (shape of articular facets on central metapodials; slenderer astragalus but less slender metapodials) suggesting a still more cursorial locomotory mode for the latter species.

Mots clés :
Mesaceratherium gaimersheimense
Diaceratherium aff. *lemanense*
Transition Oligocène-Miocène
Anatomie comparée
Biochronologie

RÉSUMÉ

Une révision taxonomique des Rhinocerotidae de l'Oligocène terminal de Thézels (Bassin de la Garonne) est proposée, fondée sur la description comparative de plusieurs centaines de restes mandibulaires, dentaires et postcrâniens. En termes d'abondance, le petit rhinocérotiné *Mesaceratherium gaimersheimense* Heissig, 1969, aux membres très élancés, domine outrageusement l'autre forme reconnue, le téléocératiné *Diaceratherium* aff. *lemanense*, de taille moyenne et aux membres plus trapus. Le matériel de Thézels permet pour la première fois de décrire des éléments postcrâniens attribuables à *M. gaimersheimense*, dont les caractéristiques étaient jusqu'alors inconnues. Cette étude confirme par ailleurs que *Mesaceratherium gaimersheimense* disparaît du registre fossile à la limite Oligocène-Miocène, alors que *Mesaceratherium paulhiacense* (Richard, 1937), dont la plus ancienne mention remonte également à l'Oligocène terminal (MP30), remplace ce dernier au Miocène basal (Aquitanien/Agénien). La région d'Agen, dans le sud-ouest de la France (région type de l'étage mammalien Agénien), fournit une séquence très bien documentée pour les rhinocérotidés de l'intervalle Oligocène terminal – Miocène basal d'Europe occidentale, avec Thézels (MP30), Paulhiac (MN1), et Laugnac (MN2). *Mesaceratherium gaimersheimense*

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https://doi.org/10.1016/j.annpal.2018.06.001
0753-3969/

Please cite this article in press as: Blanchon, M., et al., Rhinocerotidae (Mammalia, Perissodactyla) from the latest Oligocene Thézels locality, SW France, with a special emphasis on *Mesaceratherium gaimersheimense* Heissig, 1969. Annales de Paléontologie (2018), https://doi.org/10.1016/j.annpal.2018.06.001

présente quelques différences avec *M. paulhiacense* au niveau du postcrânien (astragale moins profond; disposition des facettes sur les métapodes centraux, eux-mêmes moins graciles) suggérant une meilleure adaptation à la course chez ce dernier.

1. Introduction

The Aquitaine Basin extends on about 40,000 square miles in southwestern France in a triangle limited by the Atlantic Ocean to the west, the Pyrenees to the South and the Massif Central to the Northeast. From Eocene times onward, fluvio-lacustrine deposits originating from the Massif Central and the Pyrenees accumulated and they preserved huge numbers of vertebrate remains (e.g., Richard, 1948). By the end of the Oligocene, sedimentation was mostly of detrital origin close to the Pyrenees and in the centre of the basin (molasses, marls, clays, sandstones) whereas lacustrine sedimentation deposited primarily in the northeastern edge of the basin (e.g., Cieurac limestone; Cavaillé, 1981). In the vicinity of the Thézels village, South of Cahors (Lot department, Fig. 1), the Cieurac limestone has yielded a lenticular body of marly deposits trapping a rich vertebrate fauna. A preliminary list of Thézels mammals was provided by Bonis and Guinot (1987), including rodents, a suoid (*Palaeochoerus* sp.), ruminants (*Dremotherium* cf. *Guthi* and *D.* cf. *quercyi*), rhinocerotids (*Diaceratherium* aff. *lemanense* and *Mesaceratherium* cf. *gaimersheimense*), a hyaenodontid (*Hyaenodon leptorhynchus*) and four species of amphicyonid (*Haplocyon* cf. *dombrowskii*, *Haplocyonopsis crassidens*, *Pseudocyonopsis landesquei*, and *Ysengrinia* sp.), hemicyonid (*Cephalogale* cf. *geoffroyi* and *Cephalogale* aff. *Bonali*), mustelid (*Plesictis genettoides* and *"Plesictis" milloquensis*), and ailurid carnivorans (*Amphictis* sp.), consistently pointing to a late Oligocene age for the locality (Arvernian European Land Mammal Age [ELMA]). The rodent assemblage includes *Eucricetodon thezelensis*, *Eucricetodon* sp.?, *Pseudocricetodon* sp., *Plesiosminthus admyarion*, *Plesiosminthus* sp.?, *Issiodoromys bransatensis*, *Adelomyarion vireti*, *Rhodanomys* aff. *transiens*, *Rhodanomys* sp.?, *Peridyromys murinus*, *Heteroxerus paulhiacensis*, and *Heteroxerus lavocati*, as revised by Comte (2000). These rodents have allowed for refining the age of Thézels, now unambiguously assigned to the MP30 reference level, late Arvenian ELMA, i.e., immediately prior to the Oligocene-Miocene transition (~23.03 Ma; Vandenberghe et al., 2012). We must note the lack of two genera normally present in MP 30, namely *Microbunodon* and *Archaeomys*. If not due either to paleoecological reasons or to a taphonomic bias, these absences could correspond to a level slightly younger than Coderet, the last reference level for the Oligocene epoch (MP 30).

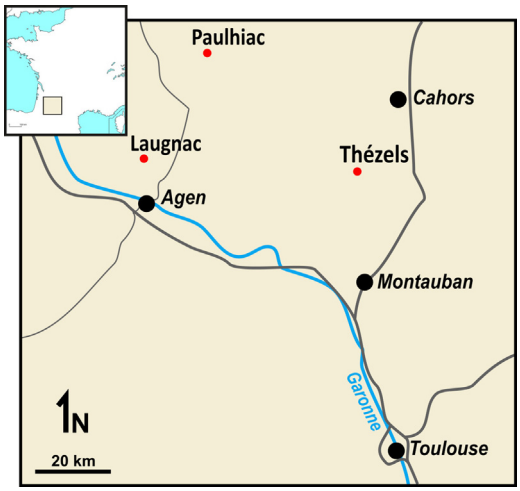

Fig. 1. Localization of Thézels (MP30) and Paulhiac (MN1), in the surrounding area of Cahors and Toulouse. Scale bar = 100 km.
Localisation de Thézels et Paulhiac, dans les environs de Cahors et Toulouse. Échelle = 100 km.

As suggested by Bonis and Guinot (1987), Thézels has yielded numerous cranio-mandibular, dental, and postcranial remains referable to two rhinocerotid species: the short-limbed teleoceratine *Diaceratherium* aff. *lemanense*, rare in the deposits (approximately 5%), and the long- and slender-limbed *Mesaceratherium* cf. *gaimersheimense* (95% in terms of specimen numbers). Remains assigned to *D.* aff. *lemanense* were thoroughly described by Michel (1983) and by Brunet et al. (1987). In this work, we will focus on specimens referable to the representative of *Mesaceratherium*, with a special emphasis on postcranial elements, which remained widely unknown so far.

2. Material and methods

2.1. Material

All Rhinocerotidae specimens from Thézels described here originate from two collections stored on CVCU (University of Poitiers, France). The so-called "old collection" (TheXXX; L. de Bonis' collection) corresponds to the remains collected during the excavations of the 1970s and 1980s with 446 cranio-mandibular, dental, and postcranial elements. The "new collection" (UP.TH.year.YYY) gathers remains collected by Master students (paleontology, University of Poitiers) in the last decade. This set includes around twenty cranial, dental and postcranial elements of Rhinocerotidae.

2.2. Comparison material

The rhinocerotid remains from Thézels were primarily compared to those assigned to Oligocene – earliest Miocene rhinocerotids from Europe, such as *Mesaceratherium* Heissig, 1969, *Diaceratherium* Dietrich, 1931, *Pleuroceros* Roger, 1898 and *Protaceratherium* Abel, 1910.

2.3. Methods

Capital letters are used for upper teeth (I, D, P, M), and lowercase letters for lower teeth (i, d, p, m). Dental terminology is that of Heissig (1972: pl. 13) and Antoine (2002) for rhinocerotids. The described anatomical features follow basically the same sequence as in Antoine (2002), and Antoine et al. (2010). Suprageneric systematics within Rhinocerotidae follows the arrangement proposed by Antoine et al. (2010) and Becker et al. (2013). Dimensions are given in mm.

2.4. Abbreviations

2.4.1. Anatomical abbreviations

Ant: anterior; APD: anteroposterior diameter; dist: distal; H: height; L: length; m.: musculus (muscle); max: maximum; Mc:

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