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New remains of *Dorcatherium crassum* (Artiodactyla: Tragulidae) from the Early Miocene (MN4) of Els Casots (Subirats, Vallès–Penedès Basin)



Nouveaux restes de Dorcatherium crassum (Artiodactyla : Tragulidae) du Miocène inférieur (MN4) de Els Casots (Subirats, bassin de Vallès–Penedès)

David M. Alba^{a,b,*}, Daniel DeMiguel^a, Jorge Morales^c, Israel M. Sánchez^c, Salvador Moyà-Solà^d^a Institut Català de Paleontologia Miquel Crusafont, Universitat Autònoma de Barcelona, Edifici ICP, Campus de la UAB s/n, 08193 Cerdanyola del Vallès, Barcelona, Spain^b Dipartimento di Scienze della Terra, Università di Torino, Via Valperga Caluso 35, 10125 Torino, Italy^c Departamento de Paleobiología, Museo Nacional de Ciencias Naturales-CSIC, c/ José Gutiérrez Abascal 2, 28006 Madrid, Spain^d ICREA at Institut Català de Paleontologia and Unitat d'Antropologia Biològica (Department BABVE), Universitat Autònoma de Barcelona, Edifici ICP, Campus de la UAB s/n, 08193 Cerdanyola del Vallès, Barcelona, Spain

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ABSTRACT

New tragulid dental remains from the late Early Miocene (16.5–16.3 Ma, MN4) locality of Els Casots (Vallès–Penedès Basin, Catalonia, Spain) are described. This sample fits well, both in size and occlusal morphology, with the material of *Dorcatherium crassum* from the type locality (Sansan, France; MN6). We therefore attribute the tragulid from Els Casots to this species, also in agreement with its known chronostratigraphic range throughout Europe (MN4–MN6) and the previous records of this species from other MN4 localities of the Vallès–Penedès Basin. The described remains – which include the postcanine lower deciduous and permanent dentition, as well as several upper cheek teeth – constitute the most complete sample of *D. crassum* from the Iberian Peninsula. The presence of this species at Els Casots is consistent with the lacustrine depositional environment inferred from sedimentological evidence and associated fauna, and further confirms the nearby presence of densely forested environments with a humid climate with low seasonality.

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R É S U M É

De nouveaux restes dentaires d'un Tragulidé de la localité de la fin du Miocène inférieur (16,5 à 16,3 Ma, MN4) d'Els Casots (bassin de Vallès–Penedès, Catalogne, Espagne) sont décrits ici. Cet échantillon correspond bien, en termes de taille et de morphologie occlusale, au matériau de *Dorcatherium crassum* de la localité type (Sansan, France; MN6). Nous attribuons donc le Tragulidé d'Els Casots à cette espèce, également d'après sa répartition chronostratigraphique connue dans toute l'Europe (MN4–MN6) et des enregistrements antérieurs de cette espèce dans d'autres localités du MN4 du bassin de Vallès–Penedès.

* Corresponding author. Institut Català de Paleontologia Miquel Crusafont, Universitat Autònoma de Barcelona, Edifici ICP, Campus de la UAB s/n, 08193 Cerdanyola del Vallès, Barcelona, Spain.

E-mail address: david.alba@icp.cat (D.M. Alba).

Les restes décrits – qui comprennent la dentition postcanine inférieure de lait et permanente, ainsi que plusieurs dents jugales supérieures permanentes – constituent l'échantillon le plus complet de *D. crassum* de la péninsule Ibérique. La présence de cette espèce à Els Casots est compatible avec le milieu de dépôt lacustre déduit des caractéristiques sédimentologiques et de la faune associée; elle confirme aussi la présence, à proximité, d'environnements à forêt dense, témoins d'un climat humide et d'une saisonnalité peu marquée.

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1. Introduction

1.1. Els Casots

The site of Els Casots was discovered in 1989 and excavated between 1989 and 1994, leading to the recovery of abundant vertebrate fossil remains – including fishes, amphibians, reptiles, birds and both small and large mammals (Moyà Solà and Rius Font, 1993; see Casanovas-Vilar et al., 2011a, for the most updated faunal list of the site). Moyà Solà and Rius Font (1993) provided a general overview of the large mammalian fauna from the site, whereas Agustí and Llenas (1993) reported a preliminary faunal list of the micromammals. Subsequently, only the sciurid and cricetodontid rodents (Aldana Carrasco, 1991, 1992; Ginestí, 2008), the equids (Rotgers and Alba, 2011) and some artiodactyls (Duranthon et al., 1995; Pickford and Moyà Solà, 1994, 1995; van der Made, 1997) have been studied in further detail.

The artiodactyl remains from Els Casots have significantly contributed to the knowledge on late Early Miocene faunas from Iberia. Pickford and Moyà Solà (1994) reported a very complete palaeochoerid cranium, which was subsequently attributed to *Taucanamo primum* by van der Made (1997). Pickford and Moyà Solà (1995) also described a new suid genus and species, *Eurolistriodon adelli*, on the basis of the material from this locality (see also Orliac, 2006). Finally, Duranthon et al. (1995) erected a new genus and species of palaeomyricid, *Ampelomyx ginsburgi*, partially on the basis of material from this site. Apart from these studies, a large portion of the mammalian fauna from Els Casots still remains unpublished. With regard to tragulids, Casanovas-Vilar et al. (2011a, fig. 3.2), Alba et al. (2011, p. 138) and Rössner and Heissig (2013, online resource 2) reported the presence of *Dorcatherium crassum* (Lartet, 1851) in Els Casots, but did not describe the material or justified such a taxonomic attribution. Here we describe and figure all the available tragulid remains from Els Casots and justify its attribution to this species on the basis of comparisons with material from the type locality (Sansan, France; Morales et al., 2012).

1.2. Tragulids

Tragulids constitute a clade of small-bodied ruminants with no cranial appendages, and a bunoselenodont to selenodont dentition with large male upper canines. Besides these primitive features, tragulids are characterized by a single main synapomorphy, i.e., the presence of an M-structure in the lower molars (for a review of this

family, see Rössner, 2007). Tragulids occupy a basalmost position among crown ruminants (Hassanin and Douzery, 2003), which coupled with their primitive morphology and physiology has led several researchers to consider them as living fossils (Janis, 1984; Rössner, 2007). Although extant tragulids (mouse deer or chevrotains) display a disjunct distribution in Southeastern Asia as well as western and central Africa, fossil representatives of this family were much more widely distributed across Africa and Eurasia (Rössner, 2007). All European and many African fossil tragulids are referred to the genus *Dorcatherium* (Fig. 1), which includes bunoselenodont to selenodont species that mainly differ in body size, some postcranial adaptations and several occlusal details (Morales et al., 2012; Rössner, 2007; Sánchez et al., 2010). First recorded from the Early Miocene of Africa (Pickford, 2001; Whitworth, 1958), *Dorcatherium* apparently dispersed into Eurasia through the *Gomphotherium*-landbridge by the latest Early Miocene (Sánchez et al., 2010), being recorded then in Europe and slightly later (by the Middle Miocene) in Asia (Rössner, 2007; Sánchez et al., 2010).

The alpha-taxonomy of *Dorcatherium* needs revision, because the morphological disparity of the species currently lumped into that genus suggests that several evolutionary lineages might be included and that, as currently defined, it might be paraphyletic (Rössner, 2007; Rössner and Heissig, 2013; Sánchez et al., 2010). The following European species of *Dorcatherium* are currently distinguished (Alba et al., 2011; Rössner, 2007, 2010; Rössner and Heissig, 2013): *D. crassum* (Lartet, 1851), from the Early to Middle Miocene (MN4–MN6); *D. guntianum*



Fig. 1. Life reconstruction of an adult male of the genus *Dorcatherium*. Artwork by Mauricio Antón.

Fig. 1. Reconstitution d'un animal vivant, mâle adulte du genre *Dorcatherium*. Dessin par Mauricio Antón.

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