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Hemicyonidae (Carnivora, Mammalia) from the Middle Miocene site of Valdemoros 4A (Zaragoza, Spain)

Hemicyonidae (Carnivora, Mammalia) del yacimiento del Mioceno Medio de Valdemoros 4A (Zaragoza, España)

Daniel Hontecillas^{1*}, Juan Abella^{2,3}, Plinio Montoya⁴ y Jorge Morales¹

En el presente trabajo se estudia un molar procedente del yacimiento Aragoniense de Valdemoros 4A (MN5, biozona local Dd), situado cerca de la localidad de Villafeliche (Zaragoza). En localidades del mismo área como Arroyo del Val, Artesilla, La Barranca y Ramblar 3B, se han encontrado fósiles atribuidos a los hemiciónidos *Hemicyon stehlini*, *Hemicyon* sp. aff. *Hemicyon sansaniensis*, *Phoberocyon hispanicus* y *Plithocyon armagnacensis*. Este fósil ha sido atribuido a *Hemicyon* aff. *mayorali* ya que es morfológicamente similar al hemicionino *Hemicyon mayorali* de Tarazona (MN5, biozona local D), aunque de talla menor.

Palabras clave: Mioceno Medio, Carnivora, Ursoidea, Hemicyonidae, Hemicyoninae

In the present work a molar from the Aragonian site of Valdemoros 4A (MN5, local biozone Dd), situated near the locality of Villafeliche (Zaragoza) has been studied. In localities of the same area, such as Arroyo del Val, Artesilla, La Barranca y Ramblar 3B, several fossils attributed to the hemicyonids *Hemicyon stehlini*, *Hemicyon* sp. aff. *Hemicyon sansaniensis*, *Phoberocyon hispanicus* and *Plithocyon armagnacensis* have been found. This fossil has been classified as *Hemicyon* aff. *mayorali* because it is morphologically similar to the Hemicyoninae *Hemicyon mayorali* from Tarazona (MN5, local biozone D), although slightly smaller in size.

Keywords: Middle Miocene, Carnivora, Ursoidea, Hemicyonidae, Hemicyoninae

1. Introduction

The mammalian fossil richness in the Cenozoic deposits from the Calatayud-Teruel basin is well known, allowing to describe three stages of the continental European chronostratigraphy (Ramblian, Aragonian and Turolian) on the basis of its fossil assemblages (Daams and Freudenthal, 1988; Azanza et al. 1993). A new fossil remain from the Valdemoros 4A site (MN5, local biozone Dd) (Daams and Freudenthal, 1981, 1988), located close to the locality of Villafeliche (Zaragoza, Spain), is studied in this paper. It is a left carnivoran m2 (VM 4A 52) (Figure 1), deposited in the collections of the Museo Nacional de Ciencias Naturales de Madrid (MNCN).

2. Systematic palaeontology

Superfamily Ursoidea Fischer, 1814
 Family Hemicyonidae Frick, 1926
 Subfamily Hemicyoninae Frick, 1926
 Genus *Hemicyon* Lartet, 1851
Hemicyon aff. *mayorali* Astibia et al. 2000

3. Description of the material

Left m2 (VM 4A 52): The molar is longer than wide (L=18.55 mm, W=11.87 mm). Sub-rectangular in occlusal view, with rounded mesial and distal borders. The protoconid is the largest cuspid of the trigonid. The metaconid is located in a slightly distal position compared to the protoconid. The relative height of both cuspids is unknown. However, the important wear surface in the latter, in contrast with the barely worn metaconid, probably suggests it was higher. In the mesial part of this tooth there is a shallow valley closed by the preprotocristid and the premetacristid. In the meso-lingual border there is a low paraconid. The trigonid (protoconid, metaconid and paraconid) is longer than the talonid (Ltri=11.26 mm, Ltal=8.69 mm) and it is situated in a level slightly more high. The talonid shows a shallow valley distally closed by a cristid, which links the metaconid with the large hypoconid, the latter being really worn in its labial border. There are not lingual cuspids throughout the lingual cristid. The labial wall is higher than the lingual one and slightly bell-shaped in the disto-labial angle, due to the presence of a marked cingulum.

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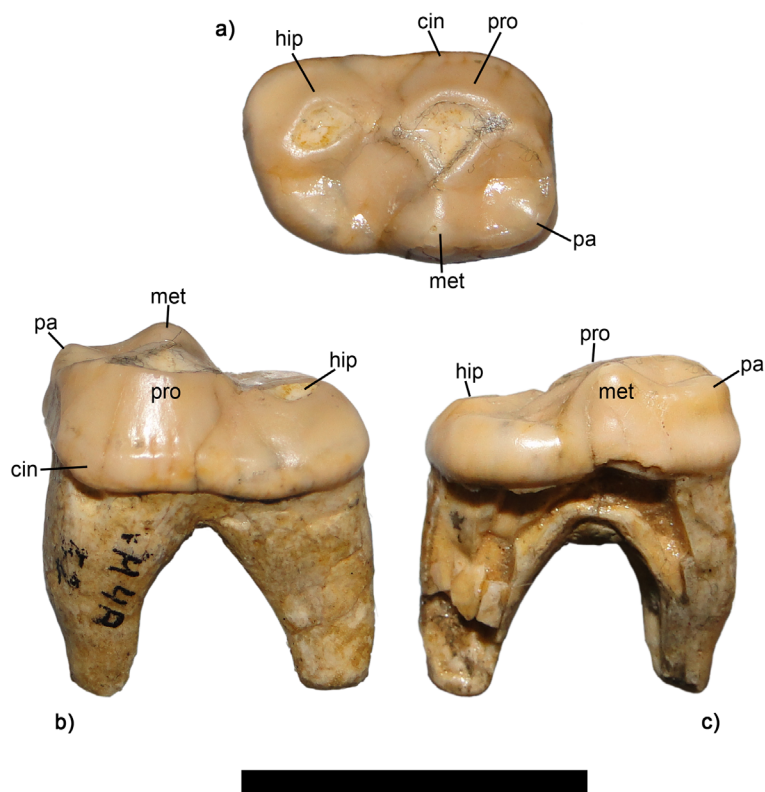


Figure 1. VM 4A 52, left m2 of *Hemicyon* sp. aff. *Hemicyon mayoralis* from Valdemoros 4A (Zaragoza): a) Occlusal view; b) Labial view; c) Lingual view. Abbreviations: cin, labial cingulum; hip, hypoconid; met, metaconid; pa, paraconid; pro, protoconid. Scale bar equals 2cm.

4. Discussion and comparison

The overall morphology of this m2 clearly belongs to a Hemicyonidae, because of the cuspids, lower and wider than those of the Amphicyonidae, and due to the lack of a meso-labial cingulum, sometimes present in the Amphicyonidae family. Within the family Hemicyonidae (Phoberocyoninae y Hemicyoninae), the m2 from Valdemoros 4A (VM 4A 52) has a similar size to the phoberocyonine *Phoberocyon hispanicus* Ginsburg and Morales, 1998 from Ramblar 3B (MNCN 73195) (MN 2) and to one of the larger specimens from Loranca 1 site (MNCN 74507) (MN 2), also belonging to this taxon (Figure 2). But VM 4A 52 differs from both specimens, having a much less-developed paraconid. In Loranca 1 there are three specimens (MNCN 74530, MNCN 74532, MNCN 74536), smaller than the studied tooth (Figure 2). Two of them (MNCN 74530, MNCN 74536) show a similar paraconid than that of MNCN 74507, whereas the other one (MNCN 74532) has a less-developed paraconid, resembling to the tooth from Valdemoros 4A. This difference in the development of the paraconid in m2, could be due to intraspecific variability in *P. hispanicus*.

Among the hemicyonines from the Iberian Peninsula, the studied tooth has a size close to the m2 of *Hemicyon stehlini* Hürzeler, 1944 (Pan 596b) from Buñol (MN 4) (Ginsburg and Morales, 1998), to the m2 of *Hemicyon sansaniensis* Lartet, 1851 from Olival de Suzanne (MN 5) (Antunes, 1960) and to the m2 of the hemimandibles of *Plithocyon armagnacensis* Ginsburg, 1955

(AV-500, AV-501) from Arroyo del Val (MN 6) (Ginsburg and Morales, 1998; Peigné et al. 2006) (Figure 2). To compare VM 4A 52 with the specimens type, this molar is longer than the m2 of *H. stehlini* from Pontlevoy (Pontlevoy-969) (MN 5) (Stehlin and Helbing, 1925; Hürzeler, 1944), although significantly smaller than the m2 of *Pl. armagnacensis* (Sa 245-246) from Sansan (Filhol, 1891) (MN 6), the m2 of the hemimandible type of *H. sansaniensis* (Sa 226) and the m2 (Sa 231) from Sansan (Filhol, 1891; Ginsburg, 1955; Ginsburg, 1961; Ginsburg and Morales, 1998) (MN 6), the m2 of *Hemicyon goeriachensis* (Toula, 1884) (Nr. 1427, a m2 without collection number) from Göriach (Hofmann, 1893; Thenius, 1949) (MN 6) and the m2 of the mandible type of *Hemicyon teilhardi* Colbert, 1939 (A.M. 26594) from the Tunggur Formation (MN 7/8) (Figure 2). But VM 4A 52 have a paraconid more prominent than these specimens.

On the contrary, the m2 from Valdemoros 4A is closer to the tooth from the type locality (Tarazona, MN 5) of *Hemicyon mayoralis* Astibia et al. 2000 (T2-220) because of its large rounded paraconid, but the latter being larger and characterized by a distally opened talonid valley (Astibia et al. 2000).

5. Conclusions

The m2 from Valdemoros 4A is classified as *Hemicyon* aff. *mayoralis* Astibia et al. (2000), because of its smaller size compared to *H. mayoralis* from Tarazona (MN 5, local biozone D),

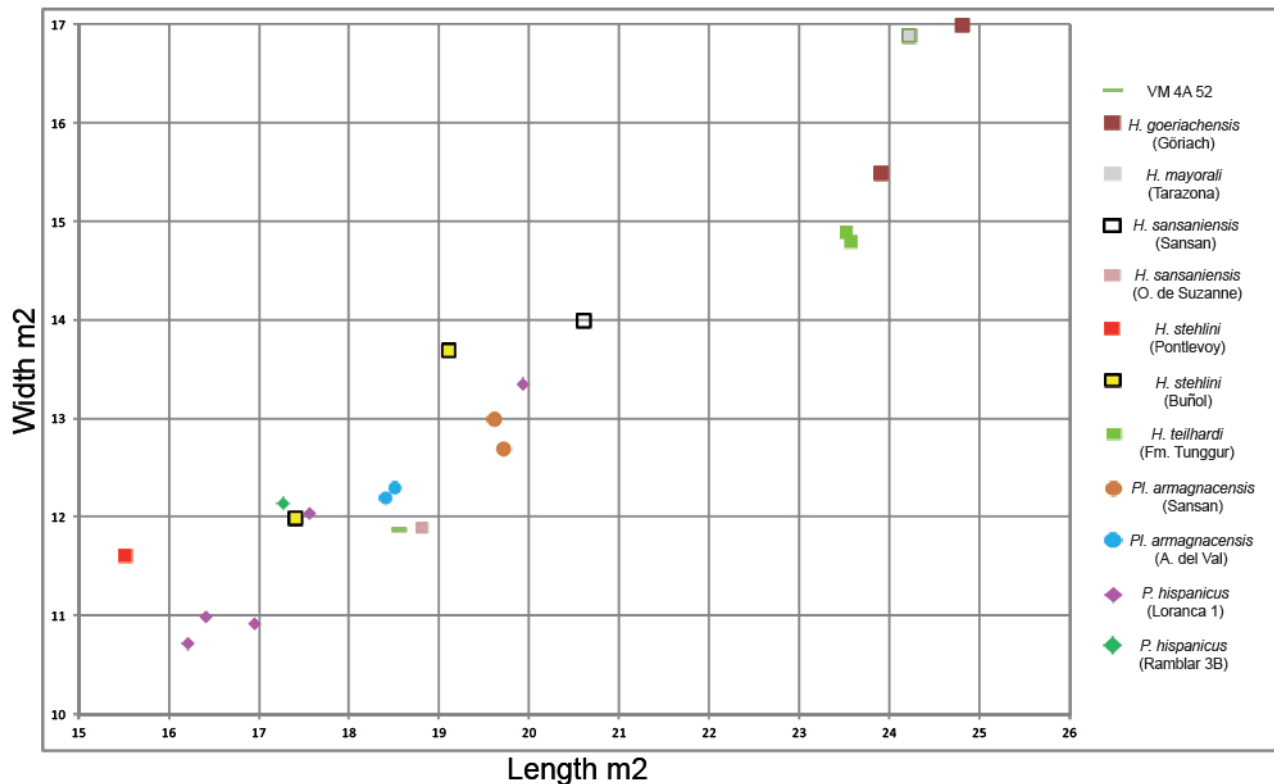


Figure 2. Scatterplot showing the relation of length and width between the studied specimen (VM 4A 52) and hemicyonids from Iberian Peninsula, Europe and Asia.

although it has a prominent paraconid. Therefore, the previous attributions of this fossil to *Hemicyon stehlini* (Fraile et al. 1997; Abella et al. 2014) must be discarded. Those differences could correspond to interspecific variability in size, or to a different species ascription of the molar from Valdemoros 4A, but it can only be determined by an increase in the sample size.

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ORGANIZAN:



PATROCINAN:

