Journal of Human Evolution xxx (2018) 1–11

Contents lists available at ScienceDirect

Journal of Human Evolution

journal homepage: www.elsevier.com/locate/jhevol

Can Pallars i Llobateres: A new hominoid-bearing locality from the late Miocene of the Vallès-Penedès Basin (NE Iberian Peninsula)

David M. Alba [a, *], Isaac Casanovas-Vilar [a], Marc Furió [a, b], Israel García-Paredes [c, a], Chiara Angelone [d, a, e], Sílvia Jovells-Vaqué [a], Àngel H. Luján [f, a, g], Sergio Almécija [h, a, 1], Salvador Moyà-Solà [a, i, j]

[a] Institut Català de Paleontologia Miquel Crusafont, Universitat Autònoma de Barcelona, Edifici ICTA-ICP, c/ Columnes s/n, Campus de la UAB, 08193 Cerdanyola del Vallès, Barcelona, Spain
[b] Departament de Geologia, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain
[c] Departamento de Paleontología, Facultad de Ciencias Geológicas, Universidad Complutense de Madrid, c/ José Antonio Novais 2, 28040 Madrid, Spain
[d] Dipartimento di Scienze, Università Roma Tre, Largo San Leonardo Murialdo, 1, 00146, Roma, Italy
[e] Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences, Xizhimen Wai Da Jie 142, Beijing 100044, China
[f] Department of Geosciences, University of Fribourg, Chemin de Musée 6, 1700 Fribourg, Switzerland
[g] Department of Geological Sciences, Faculty of Science, Masaryk University, Kotlářská 2, Brno, 611 37, Czech Republic
[h] Center for the Advanced Study of Human Paleobiology, Department of Anthropology, The George Washington University, Washington, DC 20052, USA
[i] Institució Catalana de Recerca i Estudis Avançats (ICREA), Pg. Lluís Companys 23, 08010, Barcelona, Spain
[j] Unitat d'Antropologia Biològica, Departament de Biologia Animal, Biologia Vegetal i Ecologia, Universitat Autònoma de Barcelona, 08193 Cerdanyola del Vallès, Barcelona, Spain

ARTICLE INFO

Article history:
Received 27 November 2017
Accepted 19 April 2018
Available online xxx

Keywords:
Hominoidea
Dryopithecinae
Hispanopithecus
Teeth
Vallesian
Western Europe

ABSTRACT

In the Iberian Peninsula, Miocene apes (Hominoidea) are generally rare and mostly restricted to the Vallès-Penedès Basin. Here we report a new hominoid maxillary fragment with M^2 from this basin. It was surface-collected in March 2017 from the site of Can Pallars i Llobateres (CPL, Sant Quirze del Vallès), where fossil apes had not been previously recorded. The locality of provenance (CPL-M), which has delivered no further fossil remains, is located very close (ca. 50 m) to previously known CPL outcrops, and not very far (ca. 500 m in NW direction) from the classical hominoid-bearing locality of Can Poncic 1. Here we describe the new fossil and, based on the size and proportions of the M^2, justify its taxonomic attribution to *Hispanopithecus* cf. *laietanus*, a species previously recorded from several Vallesian sites of the Vallès-Penedès Basin. Based on the associated mammalian fauna from CPL, we also provide a biochronological dating and a paleoenvironmental reconstruction for the site. The associated fauna enables an unambiguous correlation to the *Cricetulodon hartenbergeri – Progonomys hispanicus* interval local subzone, with an estimated age of 9.98–9.73 Ma (late Vallesian, MN10). Therefore, CPL-M is roughly coeval with the *Hispanopithecus laietanus*-bearing localities of Can Llobateres 1 and Can Feu 1, and minimally older than those of La Tarumba 1 and Can Llobateres 2. In contrast, CPL-M is younger than the early Vallesian (MN9) localities of Can Poncic 1 (the type locality of *Hispanopithecus crusafonti*) as well as Polinyà 2 (Gabarró) and Estació Depuradora d'Aigües Residuals –Riu Ripoll 13, where *Hispanopithecus* sp. is recorded. The associated fauna from CPL indicates a densely forested and humid paleoenvironment with nearby freshwater. This supports the view that *Hispanopithecus* might have been restricted to dense wetland forests soon before its extinction during the late Vallesian, due to progressive climatic deterioration. Coupled with the existence of other fossiliferous outcrops in the area, this find is most promising for the prospect of discovering additional fossil hominoid remains in the future.

* Corresponding author.
E-mail address: david.alba@icp.cat (D.M. Alba).
[1] Current address: Division of Anthropology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024, USA.

https://doi.org/10.1016/j.jhevol.2018.04.008
0047-2484/

1. Introduction

1.1. The hominoid find from Can Pallars i Llobateres

Miocene apes (Primates: Hominoidea) from Iberia are geographically restricted to Catalonia (NE Iberian Peninsula), mostly coming from multiple sites in the Vallès-Penedès Basin (Alba, 2012), near Barcelona (Casanovas-Vilar et al., 2016a). Although several partial hominoid skeletons have been recovered there (Moyà-Solà and Köhler, 1996; Moyà-Solà et al., 2004; Alba, 2012; Alba et al., 2012b, 2015), hominoid remains are generally scarce and mostly consist of isolated specimens, being considered 'rare' or uncommon taxa that require a large sampling effort to be adequately documented (e.g., Alba, 2012; Alba et al., 2017a). This notwithstanding, sometimes hominoid finds are the result of fortunate circumstances (e.g., the partial skeleton of *Hispanopithecus laietanus* from Can Feu 1; Alba et al., 2012b). Here we report a maxillary fragment from the site of Can Pallars i Llobateres[2] (CPL, Sant Quirze del Vallès; Llenas Avellaneda, 1999; Furió et al., 2015; Casanovas-Vilar et al., 2016a,b), which was surface-collected by J. Manel Méndez in March 2017. We describe and figure this specimen, and compare it with previously known hominoid remains from the Vallès-Penedès Basin, in order to justify its taxonomic assignment. Based on the study of the unpublished associated vertebrate fauna, we further contextualize this find from both chronological and paleoenvironmental viewpoints.

1.2. Can Pallars i Llobateres

CPL is located ca. 500–600 m NW from the site of Can Poncic[3] (CP, Sant Quirze del Vallès; Crusafont Pairó and Truyols Santonja, 1947; Figs. 1 and 2). The exact location of CP localities (Crusafont Pairó and Golpe Posse, 1972; Golpe Posse, 1974) is uncertain due to the insufficient published documentation (Crusafont Pairó and Truyols Santonja, 1947; Santafé Llopis, 1978; Llenas i Avellaneda, 1996). However, based on published photographs (Crusafont Pairó and Truyols Santonja, 1947), orthophotos from 1946 (ICGC, 2017), and recent surveys (Alba and Almécija, 2017), CP can be confidently located within an area of about 0.7 ha (Fig. 2). Hominoid remains were recovered at the locality of Can Poncic 1 (CP1) from the early 1950s to the early 1970s (Crusafont Pairó, 1958; Crusafont Pairó and Hürzeler, 1969; Crusafont-Pairó and Golpe-Posse, 1973; Moyà-Solà et al., 1990; Harrison, 1991; Golpe Posse, 1993; Alba, 2012; Alba et al., 2012a, 2013; Pérez de los Ríos et al., 2013). CP1 is the type locality of the extinct great ape *Hispanopithecus crusafonti* (Begun, 1992), otherwise only recorded from Teuleria del Firal (Begun, 1992; Alba, 2012) in the Seu d'Urgell Basin (Catalan Pyrenees).

The site of CPL was discovered in 1999, when urbanization works unearthed several Miocene large mammal remains within an area smaller than 1.5 ha (Fig. 2). These were excavated by a team from the former Institut de Paleontologia M. Crusafont in Sabadell (IPS), which also screen-washed some sediment samples. The exact provenance of most remains was not documented, but those subsequently surface-collected came from different spots (Fig. 2): CPL-A, CPL-B, CPL-P1 (=CPL-C), CPL-P3, CPL-P2, and CPL-P4. The more abundant small mammal material came from two consecutive stratigraphic horizons (CPL s.s. and CPL3) within the classical CPL area (M. Llenas Avellaneda, pers. comm. to D.M.A.; see also Llenas Avellaneda, 1999). Except for a provisional faunal list provided in the field report (Llenas Avellaneda, 1999) and a few subsequent emendations (Casanovas-Vilar et al., 2016b), the fossils from CPL remained mostly unpublished (but see Furió et al., 2015). The hominoid maxillary fragment described here was found embedded within a small sediment block of carbonated claystone in locality CPL-M (Alba et al., 2017b), within an uncultivated land parcel (Fig. 2) very close to the classical CPL outcrops (roughly equivalent to CPL-B). The find was immediately reported to the Archaeological and Paleontological Survey of the Generalitat de Catalunya, and is currently housed at the Institut Català de Paleontologia Miquel Crusafont (ICP) with catalog No. IPS102942.

2. Materials and methods

2.1. Comparisons with other hominoids

IPS102942 was compared with upper molars of other Vallès-Penedès dryopithecines (Begun et al., 1990; Begun, 1992; Golpe Posse, 1993; Moyà-Solà and Köhler, 1995, 1996; Moyà-Solà et al., 2004, 2009a,b; Alba, 2012; Alba et al., 2012a, 2013; Pérez de los Ríos et al., 2013), with particular emphasis on those from CP1 (*H. crusafonti*) and Can Llobateres 1 and 2 (CLL1 and CLL2, respectively; tooth locus identifications of *H. laietanus* from CLL1 after Alba et al., 2012a). No upper molars are available from the other Vallès-Penedès localities with *H. laietanus*, namely: La Tarumba 1 (LT1, type locality; Villalta Comella and Crusafont Pairó, 1944; Golpe Posse, 1993), Polinyà 2 (Gabarró; PO2; Crusafont-Pairó and Golpe-Posse, 1973; Golpe Posse, 1993), Estació Depuradora d'Aigües Residuals–Riu Ripoll 13 (EDAR13; Checa Soler and Rius Font, 2003) and Can Feu 1 (CF1; Alba et al., 2012b). All specimens were measured with digital calipers to the nearest 0.1 mm by one of the authors (D.M.A.). The following measurements were taken: BL, buccolingual breadth (in mm, taken both at the mesial and the distal crown portions); MD, mesiodistal length (in mm); and BLI, breadth/length index (in %, computed as maximum BL/MD × 100). Dental terminology follows Alba et al. (2013:Fig. 1).

2.2. Associated fauna

Large vertebrate remains from CPL are very scarce, including 52 specimens from CPL, CPL-B, CPL-A, CPL-P1, CPL-P3 and CPL-P4—see Supplementary Online Material (SOM) S1 for further details. The associated small mammal fauna is represented by a collection of 384 micromammal teeth from CPL and CPL3 (see SOM S1). All of the fossils are housed at the ICP.

2.3. Coordinates

Geographic coordinates for paleontological localities are given in the Universal Transverse Mercator (UTM) system, based on the European Terrestrial Reference System 1989 (ETRS89). They were verified with the aid of topographic maps and orthophotos from the web application VISSIR v3.26 of the Institut Cartogràfic i Geològic de Catalunya (ICGC, 2017).

3. Results

3.1. Description of the hominoid maxilla

IPS102942 is a left maxillary fragment (ca. 1.5 × 2.0 cm), still partially embedded in matrix, that preserves an alveolus with broken roots and a socketed molar crown (Fig. 3A–C). The specimen is poorly preserved, displaying multiple diagenetic cracks filled with sediment. Given the poor preservation, little can be said about the comparative anatomy of the maxilla, although the

[2] Formerly spelled 'Can Pallàs de Llobateres' or 'Can Pallars de Llobateres.'
[3] Formerly spelled 'Can Ponsic' or 'Can Ponsich.'

Please cite this article in press as: Alba, D.M., et al., Can Pallars i Llobateres: A new hominoid-bearing locality from the late Miocene of the Vallès-Penedès Basin (NE Iberian Peninsula), Journal of Human Evolution (2018), https://doi.org/10.1016/j.jhevol.2018.04.008