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Original article

# Re-interpreting the biochronology of the La Celia and Los Gargantones mammal sites (Late Miocene, Murcia, Spain)<sup>☆</sup>



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## ABSTRACT

The biochronological age of the small-mammal populations of Los Gargantones 1, 2 and La Celia (upper Miocene, La Celia sub-basin, Murcia, Spain) is re-interpreted. The presence in Los Gargantones of *Occitanomys adroveri*, *Parapodemus barbarae*, *Parapodemus* cf. *gaudryi*, *Huerzelerimys turoliensis*, *Atlantoxerus* cf. *adroveri*, and *Alilepus* evidences a correlation to MN12 (~7.5–7 Ma) rather than to MN11 (~9–7.5 Ma), as inferred previously. The assemblage corresponds to that of the more eastern, near-coast sites of Crevillente 8 and 15, situated in the Alicante area. The stratigraphically highest site of La Celia contains *Hispanomys adroveri*, a species also indicative of MN12. The presence of *Castromys* cf. *littoralis* together with an advanced *O. adroveri* points to a slightly younger age than that of Los Gargantones, approaching that of MN13 sites. The assemblage best matches that of Crevillente 17. Other species described in this paper are *Prolagus crusafonti*, *Prolagus* sp., *Parasorex* cf. *ibericus*, *Panelimnoecus* cf. *repenningi*, and *Blarinella* aut *Petenya* sp. indet.

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## 1. Introduction

Being a part of the so-called Prebetics of the External Zone of the Betic Cordilleras, the small basin of Jumilla-La Celia (Fig. 1) is well known for its late Neogene volcanics. The onset of volcanic activity in the area has previously been dated at 7.6–7.2 Ma (or 7.8–6.9 Ma with error bars included) using K-Ar data. This age is similar to the 7.9–6.8 Ma age of similar deposits in the neighboring Calasparra area (Nobel et al., 1981; van Balen et al., in press).

Three decades ago, several sites in the La Celia sub-basin (Fig. 1) were assigned to mammal unit MN11 on the basis of their rodent content (Agustí et al., 1985). For these sites, which were named La Celia (38° 27' 43" N, 1° 27' 34" W), and Los Gargantones (38° 27' 51" N, 1° 26' 31" W), only faunal lists were provided, with the material (which is stored in the Institut Català de Paleontologia Miquel Crusafont [ICP], Sabadell, Spain) never being described. The published La Celia (LCE) faunal list consisted of *Occitanomys*

*sondaari*, *Occitanomys* species A, *Huerzelerimys vireti*, *Hispanomys* sp. A, *Atlantoxerus* cf. *adroveri*, and *Prolagus* cf. *crusafonti*. The species from Los Gargantones (main level, named GARG or GARG1 in the collection) were identified as *Parapodemus lugdunensis*, *O. sondaari*, and *Prolagus crusafonti*. In addition, the murids *O. sondaari* and *H. vireti* were reported to come from the same stratigraphic level, but laterally (locality called GARG2 in the collection). Whereas the original spot of the La Celia site has been removed by the construction of a road cut, we have found a brownish level that very probably corresponds to the original fossil level as indicated on the sketch map in Agustí et al. (1985: fig. 7). Based on this map, we could also re-locate the GARG1 site. Because the position of GARG2 was not described, it could not be re-located.

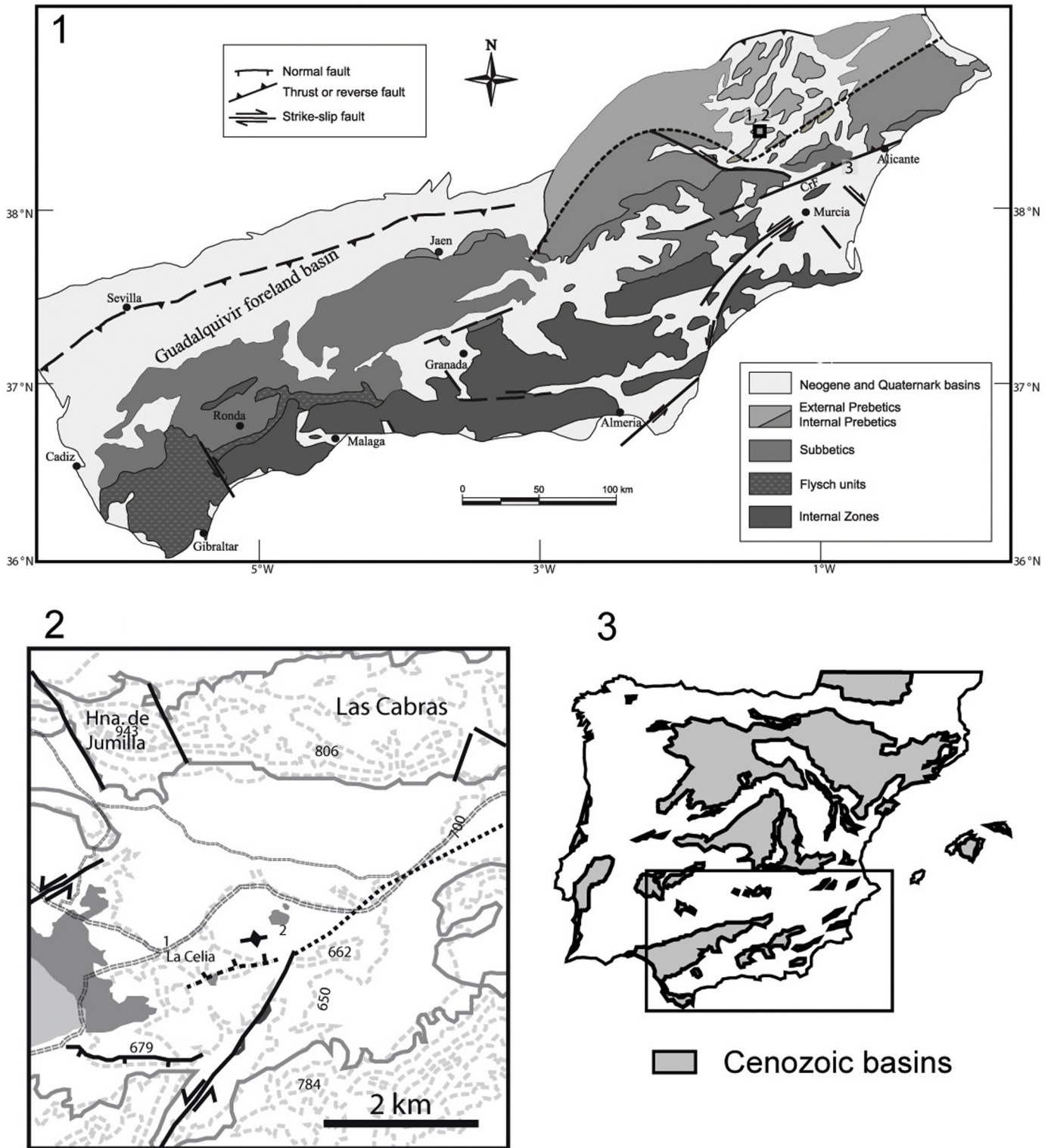
Some macromammal fossils were reported from the GARG1 site as well: Cervidae indet., *Hipparion* aff. *concludense*, *Microstonyx* sp., and *Tragoportax gaudryi*. Finally, extensive macromammal material has been recovered recently from other nearby beds (Vilas et al., 2005, 2009).

Here we describe the rodents from Los Gargantones and La Celia, which were in dire need of revision. We also describe the insectivores as well as a leporid species; these groups were not included in the first lists (Agustí et al., 1985). Our re-interpretation

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**Fig. 1.** Geographical and geological context of study area. **1.** Geological sketch map of Betic Cordilleras. Small rectangle: La Celia sub-basin (2) with 1, 2: La Celia and Los Gargantones mammal sites; 3: mammal sites of Crevillente, CrF: Crevillente fault. **2.** Map of the La Celia sub-basin with main geological faults and topography. Double dashed lines: main roads. Village of La Celia indicated as text. 1: La Celia mammal site; 2: Los Gargantones 1 mammal site. **3.** Cenozoic basins of the Iberian Peninsula. Rectangle: Betic Cordilleras region (1).

based on the complete material implies that the faunules have to be re-assigned to the mammal unit MN12 rather than to the older unit MN11, implying an age younger than ~7.6 Ma. The re-dating of these faunules is of great importance, because it may produce new constraints on the timing of the mammal turnover associated

with the MN12–13 transition around 7 Ma, that may or may not coincide with the Tortonian-Messinian boundary (7.24 Ma). Ongoing work on the chronology of the Miocene infill of the La Celia sub-basin (magnetostratigraphy,  $^{40}\text{Ar}/^{39}\text{Ar}$  dating) is expected to produce these constraints.

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