

Early Miocene Cricetidae (Rodentia, Mammalia) from Buñol (Prov. Valencia, Spain)

R. Daams and M. Freudenthal

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The Cricetidae remains from Buñol, collected by field parties of the Department of Paleontology (State University of Utrecht, The Netherlands), are described. Three previously known species have been recognized: *Megacricetodon minor primitivus* (Freudenthal, 1963), *Democricetodon* aff. *hispanicus* Freudenthal, 1967 and *Fahlbuschia* cf. *koenigswaldi* (Freudenthal, 1963). One new species is described: *Eumyarion valencianum*. The presence of *M. m. primitivus* points to an Early Miocene age (*collongensis* Assemblage-Zone).

R. Daams, Geologisch Instituut van de Rijksuniversiteit Groningen, Melkweg 1, Groningen, The Netherlands; M. Freudenthal, Rijksmuseum van Geologie en Mineralogie, Hooglandse Kerkgracht 17, Leiden, The Netherlands.

Introduction	1
Systematic descriptions	2
Stratigraphy	14
References	15
Plates	16

Introduction

The locality of Buñol discovered by Prof. Dr M. Crusafont Pairo will be described by R. Daams (in press).

The material is kept at the Department of Paleontology (State University, Utrecht) under the nrs BU 1441 - 1740, BU 1801 - 1830 and BU 1921 - 2010. The holotype and five paratypes of *Eumyarion valencianum* n. sp. are kept at the Museum of vertebrate Paleontology in Sabadell (Spain).

The specimens were measured with a Leitz Ortholux microscope (ocular 10 \times , objective 3.8 \times) with 'Ultropac' illumination and a mechanical stage with measuring clocks. The nomenclature of the parts of the cheek teeth is after Mein & Freudenthal, 1971. The measurements of the teeth are given in tenths of millimetres.

Acknowledgements

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Systematic descriptions

Family CRICETIDAE MURRAY, 1866

Subfamily CRICETODONTINAE Schaub, 1925

Tribe MEGACRICETODONTINI Mein & Freudenthal, 1971

Genus *Megacricetodon* Fahlbusch, 1964

Subgenus *Megacricetodon* Fahlbusch, 1964

Megacricetodon minor primitivus (Freudenthal, 1963)

Plate 1, figs. 1 - 6.

Measurements

	Length				Width		
	Min.	Mean	Max.	N *	Min.	Mean	Max.
M ¹	13.4	14.5	15.3	18/26	8.7	9.2	9.8
M ²	9.2	10.2	10.9	30/31	8.3	8.9	9.8
M ³	6.2	7.2	7.8	9	6.8	7.7	9.4
M ₁	11.8	13.2	14.2	17/19	7.7	8.3	8.8
M ₂	9.7	10.4	11.3	21	8.1	8.9	9.6
M ₃	8.1	8.6	9.4	13/12	6.6	7.2	7.8

* If two figures are present, the first indicates the number of specimens of which the length could be measured, whereas the second indicates the number of specimens of which the width could be measured.

Description

M₁ – The anteroconid is simple and round to bean-shaped. The anterosinusid and protosinusid are bordered by a low ridge. In 5 out of 17 specimens this low ridge is absent on the lingual side. The anterolophulid is interrupted in one specimen only. One specimen shows a short labial spur on the anterolophulid. The

sinusid points obliquely forward. The metalophulid and hypolophulid point slightly forward or they are transverse. The mesolophid is long in 4 specimens, of medium length in 9, short in 5 and absent in 1 specimen. The posterior wall of the hypoconid is slightly concave. In 11 specimens a small labial posterolophulid is present, thus forming a tiny valley posteriorly of the hypoconid. In 2 specimens the labial posterolophid arises from a small cusp on the lingual posterolophid.

M₂ — The labial part of the anterolophid is well-developed and is connected to the base of the protoconid. The lingual part of the anterolophid is narrow and reaches the lingual border of the molar in 2 specimens; it is of medium length in 10 specimens and short in 9 specimens. In 8 specimens a small valley is present between the lingual anterolophid and the metaconid. The sinusid points forward in 9 specimens, backward in 5, and it is transverse in 8. The metalophulid and hypolophulid point slightly forward. The mesolophid is long in one specimen, of medium length in 13 specimens, short in 5 and absent in 3. The ectolophid is continuous in most specimens. In two specimens it is interrupted anteriorly of the hypoconid. The posterior wall of the hypoconid is slightly concave. In one specimen a small labial posterolophid is present, thus forming a tiny valley posteriorly of the hypoconid.

M₃ — The labial part of the anterolophid is well-developed and it is connected to the base of the protoconid. The lingual part of the anterolophid is narrow and it never reaches the lingual border of the molar; it is of medium length in 10 specimens and short in 4. In 5 out of 12 available specimens a small valley is present between the lingual anterolophid and the metaconid. The metalophulid is curved backward and in one specimen it is double. In this specimen the posterior metalophulid runs from the labial base of the metaconid obliquely backward to the bottom of the mesosinusid. The sinusid points backward in 9 specimens and it is transverse in 4. The entoconid is a small cusp, indicated by a small elevation of the ridges. In one specimen the ectolophid nearly reaches the entoconid, thus forming a deep sinusid. A mesolophid is absent. The posterior wall of the hypoconid is concave. A labial posterolophid is absent.

M¹ — The anterocone is split. In 13 specimens the labial part of the anterocone is larger than the lingual part, and in 6 specimens these cusps are of equal size. In 10 specimens a small platform is present anteriorly of the base of the split anterocone. On the lingual side a low ridge descends from the anterocone towards the protocone. In 9 specimens this ridge continues along the base of the protocone to the base of the hypocone, thus separating the protocone from the tooth margin. The posterior protolophule points obliquely backward or — in one specimen — it is transverse. A rudimentary anterior protolophule is present in 14 out of 27 specimens. In one specimen this rudiment constitutes a long spur of the anterolophule which runs along the anterior base of the paracone to the labial border of the molar. In 3 specimens the rudimentary anterior protolophule is of medium length and in 10 specimens it is short. In these 13 specimens it never reaches the paracone. The metalophule points obliquely backward in all specimens. In 4 out of the 26 available specimens a spur is present on the posterior wall of the paracone. The mesoloph is long in 15 specimens, of medium length in 6, and short in 5. In 13 specimens the mesoloph curves backward to meet the anterior side of the metacone. The sinus is transverse or slightly curved forward. In 5 specimens a small and low cusp is present at the antero-labial base of the hypocone. A low ridge is present

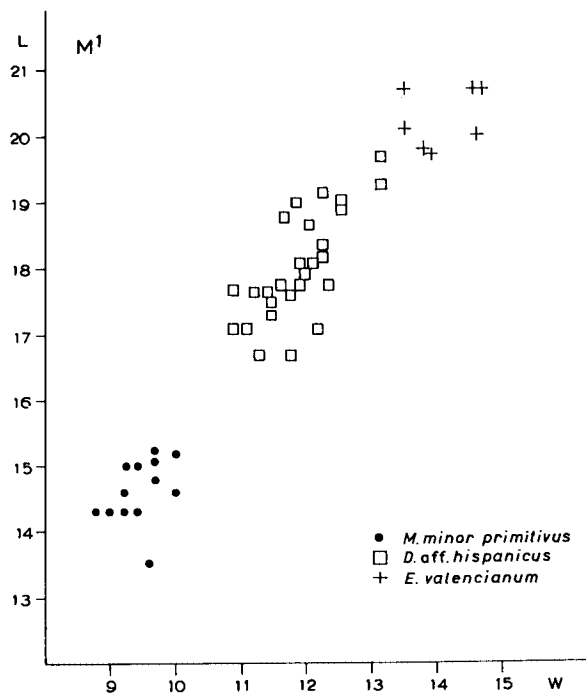


Fig. 1. Length/width diagram of M¹ of Cricetidae from Buñol.

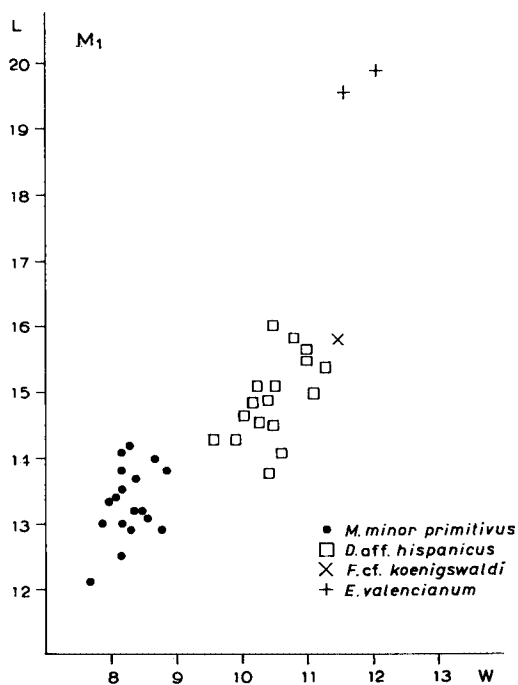


Fig. 2. Length/width diagram of M₁ of Cricetidae from Buñol.

between the protocone and hypocone along the tooth margin. A small posterosinus is present between the posteroloph and the metacone.

M² — In 8 out of 31 specimens the protolophule is double. In 4 out of these 8 specimens the double protolophule is symmetrical. In the other 4 specimens the anterior protolophule is connected to the anterior side of the protocone, whereas the posterior protolophule runs backward and is connected to the entoloph. In 16 out of the 23 specimens with single protolophule it is connected to the anterior part of the protocone and in 7 it is connected to the middle of the protocone. In 24 specimens a small spur is present on the posterior wall of the paracone. In 9 specimens this spur is connected to the long mesoloph. The mesoloph is long in 21 specimens and of medium length in 10. The sinus is transverse or it points slightly forward. A low and narrow ridge is present between the bases of the protocone and hypocone along the margin of the molar. This ridge does not continue to the anterior side of the tooth. The metalophule is transverse in 11 specimens, points forward in 11 specimens and backward in 6. In one specimen the metalophule is double. The posterosinus is clearly distinguishable.

M³ — The posterior part of the tooth is reduced. The paracone is the highest cusp. The protocone is small but still distinguishable. The protolophule points obliquely forward. From the hypocone a curved transverse metalophule is connected to the reduced metacone. In 2 specimens a long mesoloph is present. The sinus is very small in 6 specimens and absent in one specimen. In one specimen a longitudinal ridge is present between the protolophule and the metalophule. The posterosinus is clearly distinguishable.

Discussion

According to Freudenthal, 1963 the backward pointing metalophulid or mesolophid in **M₃** and the extension of the hypolophulid into the sinusid in **M₁** are rare features that do however characterise *M. m. primitivus*. In *Megacricetodon* from Buñol the backward pointing metalophulid or mesolophid in **M₃** is present in one out of 13 specimens only. The typical character of **M₁** is absent, however. In *M. m. primitivus* from its type locality Valtorres the typical character for the **M₃** is present in 5 out of 15 specimens, whereas the typical character for the **M₁** is present in 3 out of 36 specimens only. The slight differences between *Megacricetodon* from Buñol and Valtorres are not considered to be of taxonomic importance.

An evolutionary trend in *Megacricetodon* is towards the shortening of the mesolophid. In Buñol the mesolophid is of medium length to long in **M₁** and short to medium in **M₂**. In Valtorres the mesolophid is short to medium in both **M₁** and **M₂**. In Valdemoros I A the mesolophid is short in **M₁** and short to medium in **M₂**.

On the score of the length of the mesolophid, *M. m. primitivus* from Buñol represents an older evolutionary stage than *M. m. primitivus* from Valtorres. *M. m. primitivus* from Valdemoros I A should then represent the youngest evolutionary stage of these three. *M. m. primitivus* from Buñol, Valtorres and Valdemoros I A show no significant size differences.

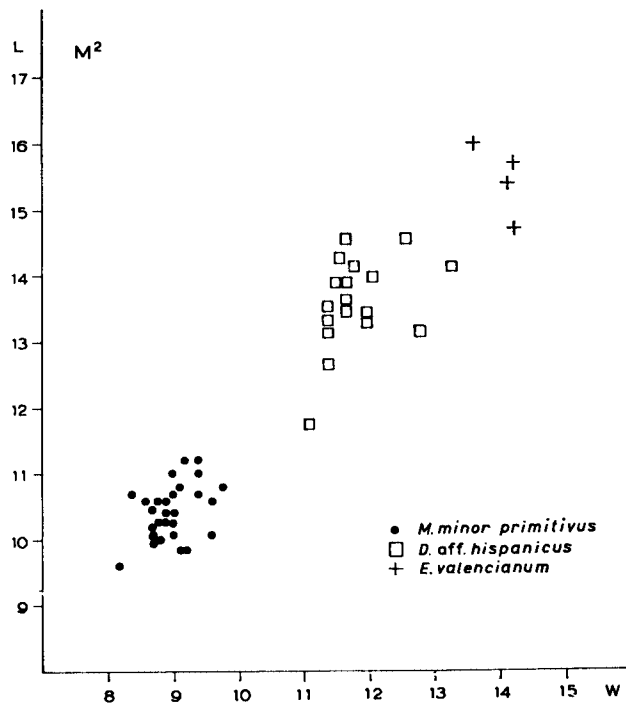


Fig. 3. Length/width diagram of M² of Cricetidae from Buñol.

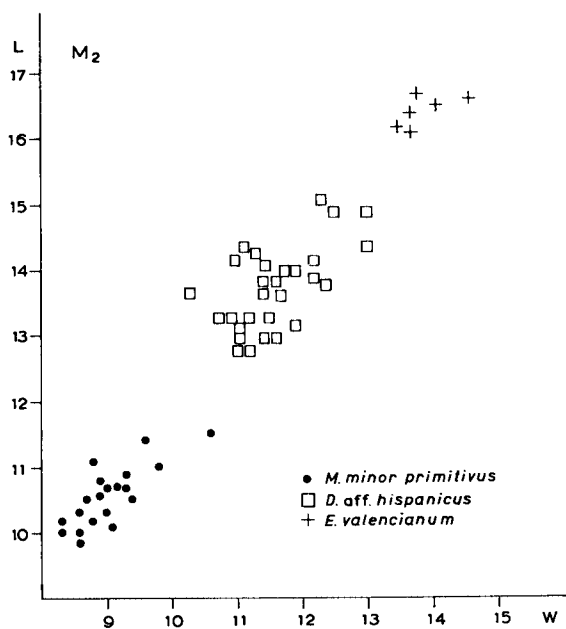


Fig. 4. Length/width diagram of M₂ of Cricetidae from Buñol.

Tribe FAHLBUSCHIINI Mein & Freudenthal, 1971

Genus *Fahlbuschia* Mein & Freudenthal, 1971

Fahlbuschia cf. *koenigswaldi* (Freudenthal, 1963)

Plate 1, figs. 7, 8.

Measurements

M₁ sin (15.1 × 11.2)

M₃ dex (13.2 × 12.1)

Description

M₁ — The anteroconid is situated near the metaconid, it is subtriangular and strongly elongated towards the labial side. The labial anterior part of the anteroconid reaches the base of the protoconid, thus closing the protosinusid. The anterosinusid is extremely narrow and shallow, and divided in two parts by a short ridge between the metaconid and anteroconid. This short ridge points obliquely forward. The metalophulid and hypolophulid point obliquely forward. The anterolophulid is short. The ectolophid is broader than the anterolophulid. The mesolophid is long and reaches the lingual border of the molar where it forms a mesostylid. The sinusid points slightly forward and it is bordered by a low ridge on the margin of the molar. Both metaconid and entoconid have a more or less flat posterior slope, meeting the lingual slope at a sharp angle. The posterolophid reaches the base of the entoconid, thus bordering the posterosinusid on the lingual side.

M₃ — The lingual anterolophid is well-developed, but a valley anterior of the metaconid is absent. The labial anterolophid is well-developed and runs towards the base of the protoconid. Both metalophulid and hypolophulid point obliquely forward. The entoconid is a relatively high cusp. The mesosinusid is lingually bordered by a moderately high ridge. The sinusid is transverse and cuts deeply into the centre of the tooth. Labially the sinusid is bordered by a low ridge. The posterolophid is narrower towards the entoconid, to which it is connected.

Discussion

The M₁ of *Fahlbuschia* cf. *koenigswaldi* from Buñol is smaller than the M₁ of *F. koenigswaldi* from Valdemoros I A. This specimen from Buñol can easily be distinguished from *Democricetodon* aff. *hispanicus* by its larger width/length-ratio, by its compact and smaller anteroconid and by the presence of a connection between the metaconid and the anteroconid.

The M₃ of *F. cf. koenigswaldi* from Buñol is of equal size as it is in *F. koenigswaldi* from Valdemoros I A. This specimen from Buñol can easily be distinguished from the M₃ of *Democricetodon* aff. *hispanicus* by its larger size and by the well-developed entoconid.

These two specimens from Buñol are provisionally assigned to *F. koenigswaldi* as the M₁ is significantly smaller than the M₁ from Valdemoros I A, but the material is too poor to allow the definition of a new species.

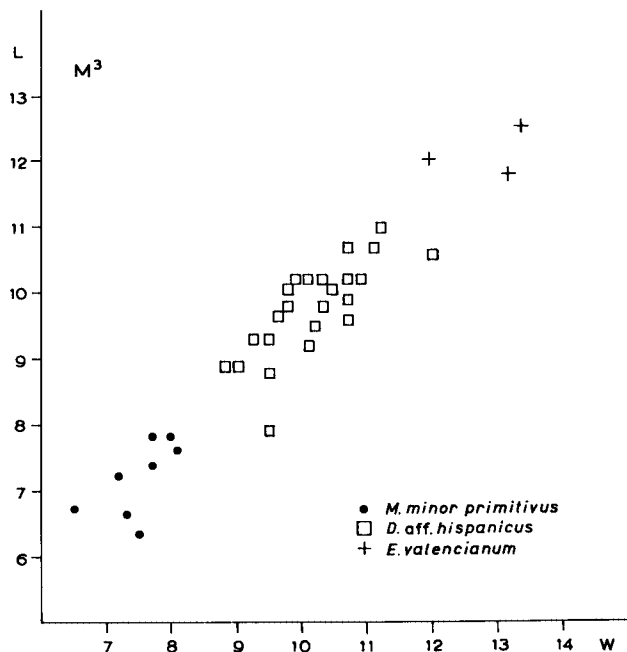


Fig. 5. Length/width diagram of M³ of Cricetidae from Buñol.

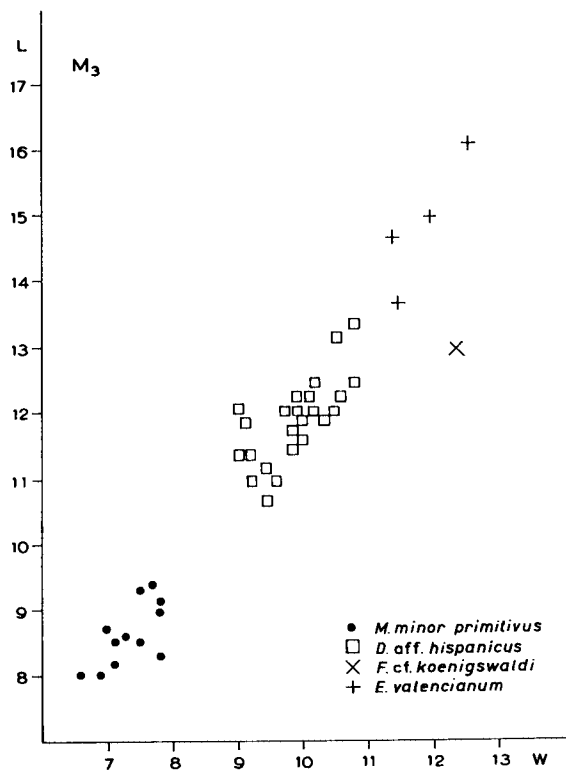


Fig. 6. Length/width diagram of M₃ of Cricetidae from Buñol.

Subfamily CRICETINAE Murray, 1866
Genus *Democricetodon* Fahlbusch, 1964

Democricetodon aff. *hispanicus* Freudenthal, 1967
Plate 1, figs. 9 - 12; Plate 2, figs. 1 - 3.

Measurements

	Length				Width		
	Min.	Mean	Max.	N	Min.	Mean	Max.
M ¹	16.7	18.0	19.7	26	11.0	12.0	13.2
M ²	11.8	13.7	14.6	19	11.1	11.9	13.3
M ³	8.8	9.9	11.0	22	8.9	10.2	12.0
M ₁	13.8	15.0	16.0	18	9.6	10.6	11.5
M ₂	12.8	13.8	15.1	34	10.3	11.6	13.0
M ₃	10.7	11.9	13.4	26	9.0	10.0	12.4

Description

M₁ — The anteroconid is the smallest cusp, laterally elongated and situated close to protoconid and metaconid. The anterolophid is short, the protosinusid and anterosinusid are narrow. The protosinusid is deeper than the anterosinusid, as the anteroconid is situated somewhat lingually. The metalophid and hypolophid point obliquely forward. In 10 out of 20 specimens the postero-lingual slopes of metaconid and entoconid are marked by sharp descending edges that separate the mesosinusid and the posterosinusid respectively from the lingual border of the molar. The mesolophid is long in 4 specimens, of medium length in 7, short in 4 and absent in 3 specimens. It does not reach the lingual border of the molar. The sinusid points obliquely forward. A low ridge is present between the base of the protoconid and the base of the hypoconid. In 4 specimens the posterolophid is separated from the entoconid by a small furrow. The posterior wall of the hypoconid is slightly concave. In 7 specimens a very small labial posterolophid is present, thus forming a tiny valley posteriorly of the hypoconid.

M₂ — The lingual anterolophid is small and does not reach the lingual border of the molar. The labial anterolophid is well-developed and ends at the base of the protoconid. The metalophid and hypolophid point obliquely forward, and are situated anteriorly of the labial cusps. In 8 out of 37 specimens the postero-lingual slope of the metaconid and entoconid is marked by a sharp edge which descends and separates the mesosinusid and the posterosinusid respectively from the lingual border of the molar. The mesolophid is long in 5 specimens, of medium length in 14, short in 7 and absent in 6 specimens. The sinusid points obliquely forward, but it is more transverse than in M₁. A low ridge between the bases of protoconid and hypoconid separates the sinusid from the margin of the molar. The posterior wall of the hypoconid is slightly concave. In 13 specimens a very small labial posterolophid is present, thus forming a tiny valley posteriorly of the hypoconid.

M₃ — The lingual anterolophid is smaller than in M₂. The labial anterolophid ends at the base of the protoconid in most specimens, but in 4 specimens it continues to the base of the hypoconid, thus separating the base of the protoconid

from the margin of the molar. The metalophulid points obliquely forward and is connected to the anterolophulid. In 4 specimens the metalophulid is double. The anterior one points obliquely forward, the posterior one is reduced and constitutes only a small and narrow longitudinal ridge which extends from the labial part of the metaconid a little way into the mesosinusid. The entoconid is indicated by a slight elevation of the ridges. The sinusid is transverse or points slightly backward. A low ridge between the bases of the protoconid and the hypoconid separates the sinusid from the margin of the molar. The mesolophid is poorly developed. In only 2 out of 29 specimens an extremely short mesolophid is present. One specimen has a short posterior arm of the hypoconid which ends free in the posterosinusid. The posterior wall of the hypoconid is concave. In one specimen only a small labial posterolophid is present, thus forming a tiny valley posteriorly of the hypoconid.

M¹ — The anterocone is transversely elongated. The anterosinus is bordered by a ridge which descends from the anterocone to the base of the paracone. From the lingual side of the anterocone a short and narrow ridge descends towards the protocone bordering the narrow protosinus. In 3 specimens a labial spur of the anterolophule is present. In 2 specimens this spur is long, in the other specimen it is extremely short. The anterolophule is connected to the lingual part of the anterocone. The protolophule is double in 10 specimens. The posterior protolophule is better developed than the anterior one, and points backward. The anterior protolophule points obliquely forward, it is complete in 3 specimens and interrupted in 7 specimens. The metalophule is mostly single; it points obliquely backward and is connected to the posteroloph. In only two specimens the metalophule is double. In one specimen the anterior metalophule points obliquely backward, whereas in the other specimen the anterior metalophule constitutes a longitudinal ridge along the lingual edge of the metacone. This longitudinal ridge is connected to the mesoloph. In both these specimens the posterior metalophule points obliquely backward. The mesoloph is long in 15 specimens, of medium length in 9 and short in 4 specimens. When the mesoloph is long, it reaches the labial border of the mesosinus. The sinus is transverse or points slightly backward. The ridge between the bases of protocone and hypocone is low and narrow, sometimes absent. The posterosinus is narrow.

M² — The labial anteroloph is connected to the paracone. The protolophule is double. The anterior protolophule points obliquely forward and is broader and better developed than the posterior one, which points obliquely backward. In 2 specimens the protolophule is single, pointing obliquely forward. The metalophule points obliquely backward in 8 specimens, is transverse in 3, and points obliquely forward in 9 specimens. The mesoloph is long in 14 specimens and of medium length in 6 specimens. The long mesolophs reach the labial borders of the molars. The sinus is transverse. The ridge between the bases of the protocone and the hypocone is low and narrow, sometimes even absent.

M³ — The two posterior cusps are reduced. The paracone is the highest cusp. The sinus is absent or slightly indicated. The anterior protolophule points obliquely forward or it is transverse. In 11 out of 22 specimens a posterior protolophule is present, visible as a longitudinal crest. A mesoloph is absent, or slightly indicated.

Discussion

Democricetodon aff. *hispanicus* is larger than *D. hispanicus* from Villafeliche II A. Other peculiarities of the Buñol material are the better developed vertical edges on the postero-lingual slope of the metaconid and the entoconid in $M_{1,2}$, the somewhat better developed lingual anterolophid in $M_{2,3}$ and the shorter mesolophid in $M_{1,2}$.

D. mutilus Fahlbusch, 1964 from the Bavarian Obere Süßwassermolasse is somewhat larger than *D. aff. hispanicus* from Buñol. Further peculiarities of *D. mutilus* are the absence of vertical edges on the postero-lingual slope of the metaconid and the entoconid in $M_{1,2}$, the less-developed lingual anterolophid in $M_{2,3}$ and the less-developed anterior protolophule in M^1 .

D. romieviensis (Freudenthal, 1963) from La Romieu is somewhat smaller than *D. aff. hispanicus* from Buñol. Further peculiarities of *D. romieviensis* are the better developed double protolophule in M^1 , the shorter mesoloph in both M^1 and M^2 , the better developed double metalophule in M^2 and the shorter mesolophid in $M_{1,2}$.

Democricetodon sp. from Valdemoros III B and Armantes I (Freudenthal, 1963, p. 69) is of about the same size as *D. aff. hispanicus* from Buñol. Further peculiarities of *Democricetodon* sp. from Valdemoros III B and Armantes I are the longer mesolophid in $M_{1,2}$ and the presence of a double metalophulid in M_2 . The upper molars of this *Democricetodon* sp. and *D. aff. hispanicus* are strikingly similar.

D. minor franconicus Fahlbusch, 1966 from the Bayerische Obere Süßwasser-Molasse is somewhat smaller than *D. aff. hispanicus*. Further peculiarities of *D. minor franconicus* are the less-developed anteroconid in M_1 , the longer mesolophid in $M_{1,2}$ and the longer mesoloph in $M^1, ^2$.

CRICETIDAE incertae sedis

Genus *Eumyarion* Thaler, 1966

Eumyarion valencianum n. sp.

Plate 2, figs. 4 - 10.

Measurements

	Length				Width		
	Min.	Mean	Max.	N	Min.	Mean	Max.
M^1	19.7	20.3	20.7	7	13.6	14.2	14.8
M^2	14.7	15.5	16.0	4	13.7	14.1	14.3
M^3	11.8	12.1	12.5	3	12.0	12.9	13.4
M_1	19.6	—	19.9	2	11.6	—	12.1
M_2	16.1	16.4	16.7	6	13.5	13.9	14.6
M_3	13.7	14.9	16.1	4	11.4	11.9	12.6

Type locality — Buñol, Prov. Valencia, Spain (for details see Daams in press).

Derivatio nominis — *valencianum* — after the province of Valencia, Spain.

Holotype — M₁ dex (cat. nr. BU 1471), length 19.6, width 11.6 (Plate 2, fig. 4).

Differential diagnosis

Eumyarion valencianum differs from *Eumyarion medium* (Lartet, 1851) from Sansan by: (1) its slightly smaller size; (2) the well-developed double metalophulid in the M₁; (3) the well-developed posterior arm of the hypoconid in the M_{1, 2}; (4) the presence of a mesolophid in M₂; (5) the less developed labial spur of the anterolophule in M₁. In *E. medium* this spur bifurcates labially, one end being connected to the labial part of the anterocone, the other end running towards the labial border of the molar; (6) the simple anterocone. In *E. medium* the anterocone is split or show a tendency to split; (7) the single protolophule in M₁; (8) the somewhat less-developed posterior spur of the paracone in M₁, ².

Eumyarion valencianum differs from *Eumyarion* n. sp. from La Romieu by: (1) its significantly larger size; (2) the presence of a posterior arm of the hypoconid in M₂; (3) the single mesolophid in M₁. In La Romieu the M₁ has a double mesolophid. Upper molars are not known from La Romieu.

Eumyarion valencianum differs from *Eumyarion bifidum* (Fahlbusch, 1964) by: (1) the discontinuous anterolophulid in M₁; (2) the symmetrical anteroconid; (3) the absence of a labial spur of the anterolophulid in M₁; (4) the continuous ectolophid in M₁; (5) the less-developed mesolophid in M₂ which is connected to the posterior metalophulid in one specimen only. In *E. bifidum* the mesolophid is always connected to the posterior metalophulid; (6) the oblique ectolophid in M₂. In *E. bifidum* the ectolophid is more longitudinal; (7) the absence of an ectomesolophid in M₂, ₃; (8) the less-developed posterior metalophulid in M₃. In *E. bifidum* the posterior metalophulid is always long and ends at the lingual border of the molar; (9) the simple anterocone in M₁; (10) the posterior spur of the anterocone, connected to the labial spur of the anterolophule in M₁; (11) the absence of a labial anteroloph in M₂; (12) the absence of a double protolophule in M₂; (13) the less-developed mesoloph in M₂. In *E. bifidum* the mesoloph always reaches the labial border of the molar.

Eumyarion valencianum differs from *Eumyarion* aff. *medium* from the Obere Süsswassermolasse by: (1) the posterosinus which is labially closed by the posterolophid in M₁; (2) the absence of an anterior arm of the protocone, extending into the anterosinus in M₂; (3) its larger size.

Description of the holotype

M₁ dex. — The anteroconid is simple and bean-shaped. The anterolophulid is absent. On the lingual side the metaconid extends forward to meet the anteroconid. The metalophulid is double. The anterior metalophulid is a free arm pointing obliquely forward, the posterior metalophulid is a longitudinal ridge which is connected to the lingual part of the protoconid. The protosinusid is bordered by a low ridge which descends from the anteroconid to the base of the protoconid. On the lingual side the posterior arm of the metaconid runs to the base of the

entoconid, thus bordering the mesosinusid. The mesolophid is of medium length and nearly reaches the lingual border of the molar. The ectomesolophid reaches the labial border of the molar. The hypolophid is transverse and is connected to the ectolophid just anteriorly of the hypoconid. The sinusid points obliquely backward. From the lingual side of the hypoconid a transverse arm with a free lingual end runs into the posterosinusid. The posterolophid is connected to the entoconid, thus enclosing the posterosinusid.

Description of the paratypes

M₁ sin. — The anteroconid is simple and bean-shaped. The anterolophid is interrupted about halfway between the anteroconid and protoconid. On the lingual side the metaconid extends forward, but it is separated from the anteroconid by a narrow and shallow furrow. The metalophid is double. The anterior metalophid is more or less transverse and ends at the interruption of the anterolophid. The posterior metalophid is longitudinal and runs from the posterior slope of the metaconid to the lingual part of the protoconid. The protosinusid is enclosed by a low ridge which descends from the anteroconid to the anterior base of the protoconid. On the lingual side the posterior arm of the metaconid runs to the base of the entoconid, thus enclosing the mesosinusid. The mesolophid is of medium length and points obliquely forward. The ectomesolophid reaches the labial border of the molar where it meets a low ridge which is connected to the anterior base of the hypoconid. The hypolophid is transverse and is connected to the ectolophid just anteriorly of the hypoconid. The sinusid points obliquely backward. From the lingual side of the hypoconid a transverse arm with a free lingual end runs into the posterosinusid. The posterolophid is connected to the entoconid, thus enclosing the posterosinusid.

M₂ — The lingual anterolophid is narrow and does not reach the lingual border of the molar. The labial anterolophid is connected to the base of the protoconid. The metalophid is double. The anterior metalophid points obliquely forward, the posterior metalophid is long and oblique and runs from the protoconid to the posterior base of the metaconid. The mesolophid is short and it is connected to the posterior metalophid in one out of 6 specimens, thus enclosing a little funnel. The hypolophid is transverse. The sinusid points sharply backward. The ridge bordering the sinusid is low. An ectomesolophid is absent. In 4 out of 6 specimens a transverse arm with a free lingual end runs into the posterosinusid from the lingual side of the hypoconid. The other two specimens are too much worn to distinguish this character. The posterolophid is connected to the entoconid, thus enclosing the posterosinusid. The posterior wall of the hypoconid is slightly concave. In one specimen a small labial posterolophid is present, thus forming a tiny valley posteriorly of the hypoconid.

M₃ — The lingual anterolophid is narrow and does not reach the lingual border of the molar. The labial anterolophid is connected to the base of the protoconid. The metalophid is double. The anterior metalophid points obliquely forward, the posterior metalophid is long and oblique and reaches the lingual border of the molar in one out of 4 specimens. The sinusid points sharply backward. In one specimen a short ectomesolophid is present. The ridge bordering the sinusid is extremely low. The entoconid is a clearly distinguishable cusp. The connection

between the posterolophid and the entoconid is low. A lingual arm of the hypoconid is absent.

M¹ — The anterocone is bean-shaped. In three specimens a transverse labial arm of the anterolophule is present. Near the labial border of the anterocone this arm curves forward and then reaches the top of the anterocone. The protolophule is transverse and connected to the entoloph just posteriorly of the protocone. In one specimen the protolophule is double. The anterior protolophule is short, has a free labial end and is labially connected to the entoloph just posteriorly of the protocone. In one specimen the protolophule is double. The anterior protolophule is short, has a free labial end and is labially connected to the protocone. On the anterior wall of the protocone a small ridge is present which is connected to the base of the anterocone in 5 out of 7 specimens. In 5 out of 6 specimens a posterior spur is present on the labial side of the paracone. This spur is relatively short, but in one specimen it runs to the base of the metacone. The sinus points sharply forward. A small and low elevation of the enamel is present on the lingual anterior base of the hypocone. In one specimen a short entomesoloph is present. The mesoloph is long in 4 specimens and of medium length in 2 specimens. The long mesolophs reach the labial borders of the molars. The metalophule points obliquely forward in 3 specimens and it is transverse in 3 specimens. In 3 specimens a short anterior labial spur of the metacone is distinguishable. The posteroloph is connected to the base of the metacone, thus enclosing the posterosinus.

M² — The lingual anteroloph is absent. The protolophule is transverse and connected to the protocone, or to the entoloph just posteriorly of the protocone. The posterior labial spur of the paracone runs to the base of the metacone, thus enclosing the mesosinus. The mesoloph is long in 2 specimens and of medium length in 2 specimens. It does not reach the labial border of the molar. The sinus points sharply forward and is bordered by an extremely low and narrow ridge. The metalophule points obliquely forward in 2 specimens and is transverse in 2 specimens. The posteroloph is separated from the metacone by a furrow.

M³ — Both posterior cups are reduced. The protolophule is transverse. The protocone and hypocone are connected to each other, thus enclosing an oval sinus. The mesoloph is long in all three specimens and reaches the labial border of the molar. The metalophule connects the metacone to the hypocone. The posteroloph is connected to the metacone, thus enclosing the posterosinus.

Stratigraphy

The stratigraphical age of the locality of Buñol is mainly determined by the occurrence of *Megacricetodon minor primitivus*. The occurrence of this species indicates an Early Miocene age (*collongensis* Assemblage-Zone, de Bruijn & Van Meurs, 1967). An evolutionary trend in *Megacricetodon* is towards a shortening of the mesolophid. In Buñol, the mesolophid is medium to long in M₁ and short to medium in M₂. In Valtorres, the mesolophid is short to medium in both M₁ and M₂. In Valdemoros I A the mesolophid is short in M₁ and short to medium in M₂.

Locality	Assemblage Zone
Valdemoros III B	<i>collongensis</i> -Zone
Valdemoros I A	
Valtorres	
Buñol	
Villafeliche II A	<i>ibericus</i> -Zone

Fig. 7. Table showing the stratigraphic position of some Spanish localities.

On the score of the length of the mesolophid, *M. m. primitivus* from Buñol represents an older evolutionary stage than *M. m. primitivus* from Valtorres. *M. m. primitivus* from Valdemoros I A represents the youngest evolutionary stage of these three.

Villafeliche II A is considered to be older than Buñol on account of the absence of *M. m. primitivus* and of the smaller size of *Democricetodon hispanicus* compared to *D. aff. hispanicus*.

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Plate 1

All figures are 25 × enlarged.

Megacricetodon minor primitivus (Freudenthal, 1963)

1. M₁ sin. (BU 1709).
2. M₂ sin. (BU 1712).
3. M₃ sin. (BU 1722).
4. M¹ dext. (BU 1954).
5. M² dext. (BU 1671).
6. M³ sin. (BU 1684).

Fahlbuschia cf. *koenigswaldi* (Freudenthal, 1963)

7. M₁ sin. (BU 1801).
8. M₃ dext. (BU 1811).

Democricetodon aff. *hispanicus* (Freudenthal, 1967)

9. M¹ sin. (BU 1922).
10. M¹ dext. (BU 1515).
11. M₁ dext. (BU 1564).
12. M₂ dext. (BU 1598).

PLATE 1

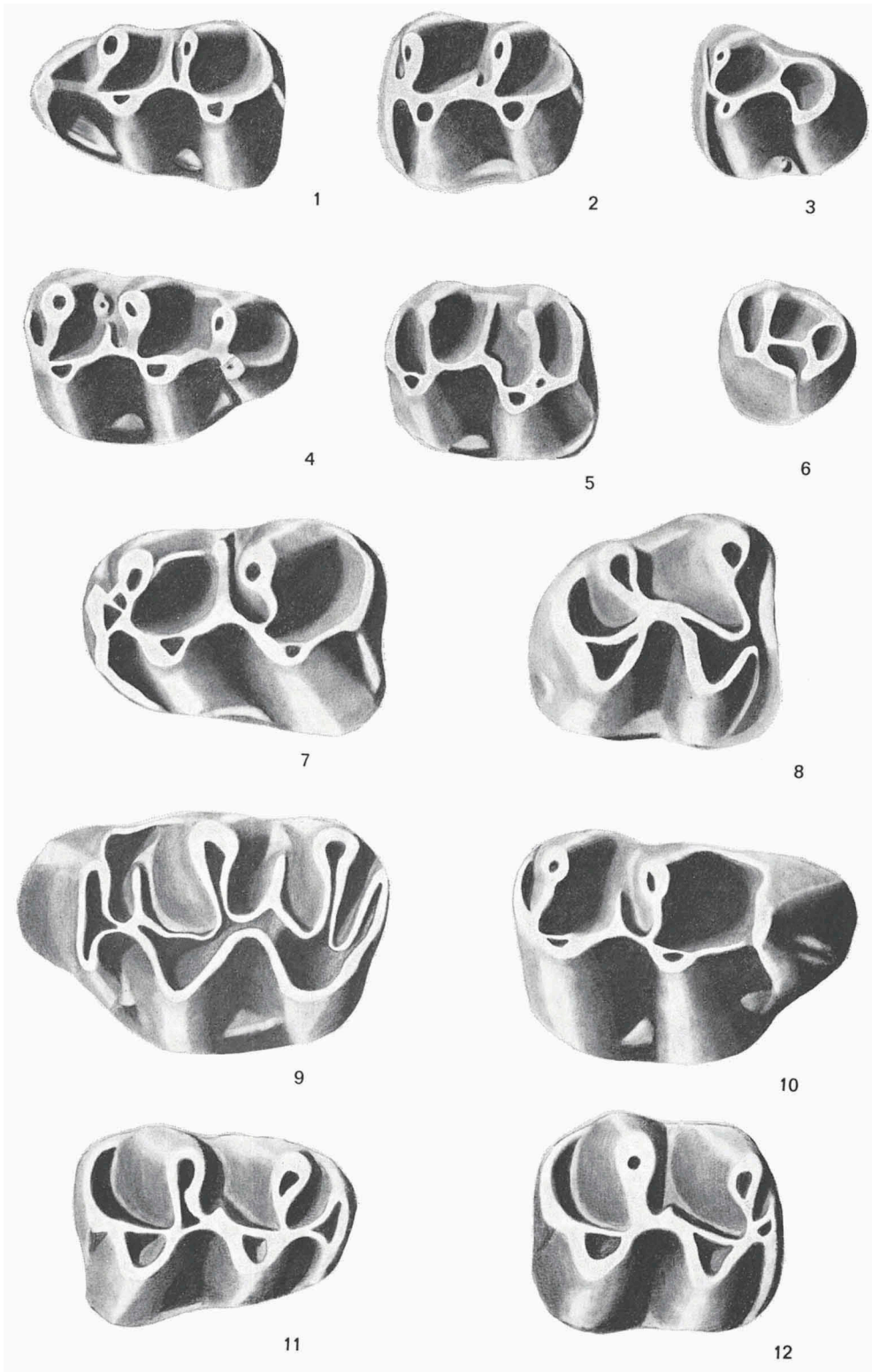


Plate 2

All figures are 25 × enlarged.

Democricetodon aff. *hispanicus* (Freudenthal, 1967)

1. M₃ dext. (BU 1631).
2. M² dext. (BU 1931).
3. M³ dext. (BU 1535).

Eumyarion valencianum n.sp.

4. M₁ dext., holotype (BU 1471).
5. M₁ sin. (BU 1476).
6. M₂ sin. (BU 1483).
7. M₃ dext. (BU 1496).
8. M³ dext. (BU 1461).
9. M¹ dext. (BU 1443).
10. M² sin. (BU 1451).

PLATE 2

