CLASSIFICATION OF EUROPEAN OLIGOCENE CRICETIDS

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ABSTRACT

A proposal is made for a classification of Oligocene European cricetids. Various problems concerning the evolution of *Euricetodon* and *Pseudocricetodon* are discussed. A new species of *Pseudocricetodon* is described from a level slightly lower than the oldest occurrence of the genus, known so far.

Keywords: Cricetidae (Mammalia), Oligocene, Spain.

RESUMEN

En este trabajo se propone una clasificación de los Cricetidos del Oligoceno de Europa. Se discuten varios problemas relativos a la evolución de *Euricetodon* y *Pseudocricetodon* y, dentro de este último género, se describe una nueva especie procedente de un nivel más antiguo que la distribución anteriormente conocida del género.

Palabras clave: Cricetidae (Mammalia), Oligoceno, España.

INTRODUCTION

In 1986 we decided to undertake a revision of the cricetid genera *Euricetodon* Thaler, 1966 and *Pseudocricetodon* Thaler, 1969. Since Montalbán (prov. Teruel, Spain) is the type-locality of the type-species of *Pseudocricetodon*, we found it necessary to carry out new prospections and excavations in the area of Montalbán. Apart from the excavation of the classical site of Montalbán, many new fossiliferous localities were discovered, which yielded a wealth of material, mainly Thériodomorpha, Cricetidae, Gliridae, and Eomyidae. Some results have been published already (Freudenthal, 1988, Freudenthal *et al.*, 1990), but it will take much time to study the very large collections available now.

So far our study of the material has been dedicated mainly to the Cricetidae, more precisely to the problem how to distinguish the two genera mentioned above. *Pseudocricetodon* was created as a monospecific genus by Thaler (1969). Hugueney described two new species, *Pseudocricetodon thalieri* in 1969, and *Pseudocricetodon philippi* in 1971. In 1980 the same author transferred *Euricetodon incertus* (Schlosser, 1884) to the genus *Pseudocricetodon*, and in 1985 Comte did the same with *Euricetodon moguntiacus* Bahlö, 1972. Apart from these taxonomic adjustments, and in spite of the large number of publications on Oligocene cricetids that have appeared in the past decades (Bahlö, 1975; Brunet, 1979; Comte, 1985; Dienemann, 1987; Hugueney, 1969, 1971; Vianey-Liaud, 1971, 1972, 1974, and many others) the classification of this group remained basically untouched since the work by Mein & Freudenthal (1971). In 1987 Engesser created the subfamily *Pseudocricetodontinae* and in 1989 Ünay-Bayraktar in her study of Middle Oligocene Turkish rodents published an entirely new concept of the classification of Oligocene cricetids. In this paper we will comment that classification and propose an alternative, that deviates less from the current one.

THE CLASSIFICATION PROPOSED BY ÜNAY-BAYRAKTAR

Ünay-Bayraktar (1989) presents a proposal for a new taxonomic classification of Oligocene cricetids. She states “The philosophy which is a: the basis of our classification is that it should lead to a flexible system, a system which is by no means presented as natural or perfect, but which can be easily adapted when new information becomes available”. (Op. cit., p. 17). However, the preamble of the International Code of Zoological Nomenclature reads “The object of the Code is to promote stability...”. Furthermore she states “The larger part of this classification will be clarified in the discussion of the Thracian representatives of the Muroidea” (op. cit. p. 18). Unfortunately this clarification
lacks in her paper. We will here discuss some details of Únay’s classification.

**Family Melissiodontidae.**

Únay-Bayraktar assembles two subfamilies in her family Melissiodontidae: Paracricketodontinae and Melissiodontinae. Unfortunately she gives no arguments for this arrangement. Her only statement related to this subject is (op. cit., p. 38) “We therefore have come to the conclusion that the subfamilies Paracricketodontinae with the genera **Paracricketodon** and **Trakynys** and the subfamily Melissiodontinae with the genera **Melissiodon** and **Edirnella** are closely related and probably constitute a group of family rank”. Her opinion that **Paracricketodon** and **Trakynys** are related appears to be perfectly correct, but the grouping of **Melissiodon** and **Edirnella** is less obvious. After Únay-Bayraktar the best distinctive character for the Melissiodontinae is the antero-lingual cusp (**Melissiodon** cusp) in M1. This cusp is indeed well-developed in **Melissiodon** and present, though less-developed, in **Edirnella**. However, apart from the question whether this accessory cusp may be attributed such importance, it is not useful as a grouping character, since it appears in **Heterocricketodon** and various **Eucricetodon** with the same degree of development as in **Edirnella**, and it is at least present in other **Eucricetodon** and in **Paracricketodon**.

Únay’s morphological sequence **Paracricketodon - Trakynys - Edirnella - Melissiodon** (op. cit., p. 37, 38) may well be interpreted by placing both **Trakynys** and **Edirnella** in the Paracricketodontinae. The predominance of crests over cusps as seen in **Edirnella** is a development known to happen in various cricetid groups, and in itself does not present an argument for taxonomic relationship (e.g. the Late Miocene cricetine **Hattomys** has a dental pattern that is possibly more like **Melissiodon** than the one of **Edirnella**).

The Melissiodontinae appear to be a different group that need not even be closely related. Possibly the dental pattern is not a good criterion to solve the problem. According to Schaub (1925) the mandible of **Melissiodon** is quite different from the one of **Paracricketodon**. Skull and mandible characters may be better arguments than dental morphology in solving these taxonomic problems.

**Family Pseudocricketodontidae**

Engesser (1987) created the subfamily Pseudocricketodontinae, with the following diagnosis: “Small to large Oligocene and lower Miocene cricetids with rather lophodont molars. M1 with large prelobe, straight or even concave labial edge, and often long anterior arm of protocone. M2 with double protoloph. M3 mostly with posterior crest of the paraconid and often double mesoloph. M1 and M2 mostly without the posterior arm of the hypoconid” (op. cit., p. 991).

Únay-Bayraktar (1989) raised this subfamily to family rank, and gave a diagnosis for the family Pseu-
PROPOSED CLASSIFICATION OF Oligocene CRICETIDs

We hereby propose a classification of European Oligocene cricetids, that differs considerably less from the current one than Unay’s proposal, and reflects fairly well our present knowledge of this group (see also Table 1):

Table 1.

<table>
<thead>
<tr>
<th>Family</th>
<th>Cricetidae Murray, 1866</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subfamily</td>
<td>Paracricetodontinae Mein &amp; Freudenthal, 1971</td>
</tr>
<tr>
<td>Paracricetodon Schaub, 1925</td>
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</tr>
<tr>
<td>Trakymys Unay-Bayraktar, 1989</td>
<td></td>
</tr>
<tr>
<td>Edirnella Unay-Bayraktar, 1989</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>Eucricetodontinae Mein &amp; Freudenthal, 1971</td>
</tr>
<tr>
<td>Eucricetodon Thaler, 1966</td>
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<tr>
<td>Eumyarion Thaler, 1966</td>
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</tr>
<tr>
<td>Mirabella de Bruijn, Unay, Saraç &amp; Klein Hofmeier, 1987</td>
<td></td>
</tr>
<tr>
<td>Subfamily</td>
<td>Pseudocricetodontinae Engesser, 1987</td>
</tr>
<tr>
<td>Tribe</td>
<td>Pseudocricetodontini Engesser, 1987</td>
</tr>
<tr>
<td>Pseudocricetodon Thaler, 1969</td>
<td></td>
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<tr>
<td>Lignitella Unay-Bayraktar, 1989</td>
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<tr>
<td>Kerosinia Unay-Bayraktar, 1989</td>
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<tr>
<td>Tribe</td>
<td>Heterocricetodontini Unay-Bayraktar, 1989</td>
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<tr>
<td>Heterocricetodon Schaub, 1925</td>
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<tr>
<td>Cinamyarian Agusti &amp; Arbiol, 1989</td>
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</tbody>
</table>

Family Melissiodontidae Stehlin & Schaub, 1951 |
Melissiodon Schaub, 1920

Family incertae sedis |
Subfamily Adelomyarianinae Unay-Bayraktar, 1989 |
Adelomyarian Huguene, 1969.

Family Cricetidae Murray, 1866 |
Subfamily Paracricetodontinae Mein & Freudenthal, 1971

Attributed genera:
Paracricetodon Schaub, 1925 |
Trakymys Unay-Bayraktar, 1989 |
Edirnella Unay-Bayraktar, 1989

Diagnosis (mainly after Bahlo, 1975). Medium-sized to large cricetids. Ectolophid poorly developed. Metaconid and entoconid connected by a high cingular ridge along the border of the lower molar. M1 and M2 with free hypoconid hind arm. Anteroconid of M1 poorly developed and anterior metalophulid absent. M3 on the average longer and broader than M1. M2 and M3 with free anterior arm of the protocone. Posterior part of M3 little reduced. Mandible almost vertical with respect to the occlusal surface, diastema flat.

N.B. Eucricetodon robustus Agusti & Arbiol, 1989 may belong to the Paracricetodontinae, instead of being an Eucricetodon.

Subfamily Eucricetodontinae Mein & Freudenthal, 1971

Attributed genera:
Eucricetodon Thaler, 1966 |
Eumyarion Thaler, 1966 |
Mirabella de Bruijn, Unay, Saraç & Klein Hofmeier, 1987 |

Proposed diagnosis: Small to large cricetids, dentition with rather bunodont cusps. Mandible transversally inclined with respect to the occlusal surface, diasteme concave with steep posterior border. Maxilla with short foramen incisivum, not—or only slightly—entering between the M1.

Lower molars: M1 smaller than M2. Posterior part of M3 generally reduced. Protoconid hind arm in M1 and M2 frequently present in M3. It may be connected to the metaconid. Anterior metalophulid in M1 frequently present. Posterolophid of M1 often forms a wide curve. In M3 and M2 the metalophulid is generally placed far forward, and the anterossinid reduced.

Upper molars: Lingual border of M1 straight or convex, forming an angle of less than 90° with the posterior border. The prelobe of M1 may be set off from the rest of the molar, but more frequently the lingual border between anterocone and protocone is smooth.

N.B. Eumyarion is possibly an Eucricetodontine; the position of Mirabella is by no means clear; we place it here because Unay-Bayraktar (1989) places it in the same subfamily as Eumyarion.

Subfamily Pseudocricetodontinae Engesser, 1987

Diagnosis: (modified after Engesser, 1987). Small to large Oligocene and lower Miocene cricetids with rather lophodont molars. M1 with large prelobe, straight or even concave labial edge, and often long anterior arm of the protocone. M2 with double protolophule. M1 mostly with a strong ridge descending from the metaconid, along the border of the tooth, into the mesosinusid, without reaching the entoconid. In M2 the mesolophid is frequently double. M1 and M2 nearly always without the posterior arm of the hypoconid. Mandible transversally inclined with respect to the occlusal surface, diasteme concave.

N.B. The diagnosis has been modified, because the terminology applied by Engesser has some terms for the upper and the lower dentition mixed up. Some details have been added.

Tribe Pseudocricetodontini Engesser, 1987

Attributed genera:
Pseudocricetodon Thaler, 1969 |
Lignitella Unay-Bayraktar, 1989 |
Kerosinia Unay-Bayraktar, 1989

Proposed diagnosis: Small Pseudocricetodontinae, foramen incisivum in the maxilla short (posterior border lying before the foremost point of the M1).

Lower molars: M1 smaller than M2. Posterior part of M2 less reduced than in Eucricetodontinae. Protoconid hind arm in M1 and M2 nearly always present, in M3 nearly always connected to the metaconid. An-
terior metalophulid in M1 rarely present. Posterolophid of M1 hardly curved, running straight towards the entoconid. In M2 and M3 the metalophulid is generally more or less transverse, which, combined with a long anterolophulid results in a wide anterosinusid. Posterior branch of the hypocoind hardly ever present.

Upper molars: Lingual border of M1 straight or concave, forming an angle of about 90° with the posterior border. The prelobe of M1 is frequently set off from the rest of the molar, the lingual border between anterocone and protocone presenting a sharp angle.

Tribe *Heterocricetodontini* Ünay-Bayraktar, 1989

Attributed genera:
*Heterocricetodon* Schaub, 1925
*Cincamyarion* Agustí & Arbiol, 1989

*Proposed diagnosis*: Medium to large pseudocricetodontines. The foramen incisivum of the maxilla is known in *H. incertus* and in a *Heterocricetodon* from Gaimersheim; in both cases it extends backwards between the M1, M2 frequently shows a free anterior branch of the protocone. Third molars not very much reduced.

N.B. Following Daams *et al.* (1989) the genus *Heterocricetodon* includes Cricetodon incertus* Schlosser, 1884.

N.B. *Cincamyarion* is placed in this group on the basis of dental morphology; the foramen incisivum of the maxilla is not known.

Family *Melissiodontidae* Stehlin & Schaub, 1951

Attributed genus:
*Melissiodon* Schaub, 1920

*Proposed diagnosis*: Mandible without a marked masseter triangle, the incisor is not prolonged into the ramus ascends, but ends below the M2. The symphysis is very small (mandible characters after Schaub, 1925).

In the dentition the cusps are very much reduced, and the crests predominate. The dental pattern is very complex. Anteroconid of M1 with one or two cusps. M2 relatively long. M1 very large, with two cusps in the anterocone.

**Incertae sedis**

Subfamily *Adelomysarioninae* Ünay-Bayraktar, 1989

Attributed genus:
*Adelomysarion* Hugueney, 1969.

*Proposed diagnosis*: Upper molars with oblique entoloph, pointing towards the paracoonid, or connected to this cusp; there is a tendency to interrupt the posterior branch of the protocone, resulting in a strongly oblique sinus, that may in some cases continue into the anterosinus; the outline of M1 between anterocone and protocone is straight and oblique or hardly indented.

In the lower molars the metalophulid of M1 is frequently absent; in M2 the mesolophid is often absent; the M3 is rather short.

**REMARKS ON EUCRICETODON**

Most authors (Bhalo, 1975; Brunet *et al.*, 1981; Comte, 1985; Dienemann, 1987) distinguish various groups, or evolutionary lineages, within the genus *Eucricetodon*. Roughly these groups could be: *E. atavus-huberi-huizerleri-praeursor-collatus-gerandinus* and *E. dubius-hochheimensis-haslachensis*.

Many discussions about this subdivision, and the possible phylogeny of *Eucricetodon* center around the distinction between *E. dubius* (Schaub, 1925) and *E. praecursor* (Schaub, 1925). For that reason a short discussion of the problems concerning these two taxa is given here.

*E. dubius* and *E. praecursor* are two species of roughly the same size and morphology. The holotype of *E. dubius* is the mandible QT 764 from the Quercy (Lot-et-Garonne, France), kept in the Basel Museum; the holotype of *E. praecursor* is the mandible QT 763 from the Quercy, in the same museum.

Morphologically these two specimens are quite similar. Differences between the holotypes are:

The mandible of *E. praecursor* is moderately inclined with respect to the occlusal surface; the mandible of *E. dubius* is almost vertical, when the occlusal surface is oriented horizontally. The diasteme of *E. praecursor* is possibly deeper than it is in *E. dubius*.

Contrary to the description by Schaub (1925) the incisor of *E. praecursor* bears three ribs, whereas in *E. dubius* it bears two ribs.

In the M1 of *E. praecursor* the metaconid is connected to the anteroconid by a high cingulum ridge; the metaconid is very much isolated from the protoconid; there is a small mesoconid; the mesolophid is thin and of medium length; the posterior branch of the hypoconid is long and it ends free; in the M1 of *E. dubius* the metaconid is connected to the anteroconid by a low cingulum ridge; there is no mesoconid, the mesolophid is short; the posterior branch of the hypoconid is long and connected to the entoconid.

In the M2 of *E. praecursor* the posterior branch of the protoconid is short, the mesoconid is weak, the mesolophid short, the ectomesolophid strongly developed; the posterior branch of the hypoconid is short; in the M2 of *E. dubius* the posterior branch of the protoconid is long, there is no mesoconid, the mesolophid is of medium length, there is no ectomesolophid; the posterior branch of the hypoconid is not visible, but probably present and fused with the very broad posterolophid.
In the M₂ of *E. praecursor* the posterior branch of the protoconid is short, the mesoconid is weak, the mesolophid absent; the hypolophulid is short (less than half the posterior tooth width); in the M₂ of *E. dubius* the posterior branch of the protoconid is long, there is no mesoconid, the mesolophid is of medium length; the hypolophulid is long (about half the posterior tooth width).

This is the kind of differences that in themselves are not sufficient to distinguish two species. Only when they materialize in statistically reliable samples, can they be used to distinguish species.

The best differences between these two species might be found in the upper molars, but these are not present in Schaub's original material from the Quercy. Schaub's statement that he had been able to distinguish upper molars to match the two holotype mandibles may be one hundred percent correct, but it can, unfortunately, not be proven. The upper molars Schaub attributes to these species come from Puy-de-Montdoury (Puy-de-Dôme, France), and their relation with the two mentioned holotype mandibles from the Quercy is not sure. The interpretation may be inverted, and it is also possible that one or two species more are involved. So, to solve the problem, we will have to try and find sufficiently large samples of similar *Exricetodon* material.

Brunet (1979) describes *E. praecursor* from La Milloque (Lot-et-Garonne, France) on the basis of 30 to
50 specimens per element, quite a good sample.

Both holotype mandibles (E. praecursor and E. dubius) fit perfectly well in the morphological and metrical variability of the population from La Milloque. The measurements of the holotype of E. praecursor are all slightly larger than the mean values in the sample from La Milloque; the measurements for the holotype of E. dubius are slightly smaller than the maximum values for La Milloque. This leads to two conclusions:

1) The two holotype mandibles may well belong to a single species.

2) The supposition (Schaub, 1925; Brunet et al., 1981), that the hind molars in E. dubius are relatively less reduced than in E. praecursor, is not tenable. This becomes clear in Fig. 1, where the lengths of the molars of the two holotype mandibles are compared with the minimum, mean and maximum of E. praecursor from La Milloque, and E. dubius from Pech Desse and Pech du Fraysse. Basically all lines are parallel, with the exception of the line for the maxima of the population from La Milloque, where the M2 is slightly smaller than expected.

Brunet (1979) and Comte (1985) give similar graphs, but instead of giving absolute values, they choose one reference population, drawn as a straight line, and calculate the lines for the other populations in terms of the logarithms of the differences with the reference. This method is not recommendable for various reasons:

Logarithms in this case serve no purpose at all; choosing a reference population obscures the real data, and may produce an undesirable optical impression. Furthermore the graph may be influenced by the accidental underrepresentation of one of the dental elements in the reference population. In Kütigen (reference population in Brunet, 1979, p. 657) only 7 specimens of M3 are available, not sufficient to calculate a reliable mean value, and M3 is poorly represented by 11 specimens. In Pech Desse (reference population in Comte, 1985, p. 32) only 10 specimens of M3 are available. This may mean, that in both cases the lines for all the other populations might take a considerably different shape when a sufficiently large number of specimens were found for each dental element of the reference population.

When the absolute size is taken as the standard, the graph is easily read, one may add his own data without any difficulty, and a change in the data for one of the lines does not influence the other ones.

The largest published samples of E. dubius are the ones described by Comte (1985) from Pech Desse and pech du Fraysse Quarry. Both holotype mandibles (E. praecursor and E. dubius) fit in the morphological and metrical variability of these populations. But, unfortunately these are not homogeneous samples. A simple analysis of the measurement tables shows that at least the M1 from Pech Desse, and the M2, M3, and M4 from Pech du Fraysse show such high variability values (V as defined by Freudenthal & Cuénet-Bescós, 1984), that almost certainly they must contain various species. So, these samples are not fit to help us in a discussion on the identity of the two species under question.

The German locality of Gaimersheim has yielded a large sample attributed to E. dubius, but here again there is sincere doubt about its homogeneity.

In the sample of E. dubius from Vivel del Rio (Teruel, Spain), described by Huguene y et al. (1987) at least two species are represented (personal observation).

If the number of ribs on the lower incisor is a taxonomically valid criterion, it may be necessary to attribute (most of) the populations known as E. dubius to E. praecursor. However, the difference between the two and three ribs is possibly not a diagnostic feature. Possibly E. dubius and E. praecursor represent one species. There is another argument for this theory:

E. praecursor, according to the table compiled by Brunet & Vianey-Liaud (1987) is restricted to "zone MP 29" with reference locality Rickenbach. E. dubius is reported only from older levels.

Thanks to the work of the Montpellier research group, today a very large number of localities from the Quercy is known (for an overview see Remy et al., 1987), where E. dubius has been reported. Not a single Quercy locality is attributed to the level of Rickenbach. Schaub had one mandible of E. dubius (QT 764), and two mandibles of E. praecursor (QT 763 and QT 984). It is a very odd chance, that the latter two mandibles should come from a Quercy locality belonging to a stratigraphic level not represented in the vast collections available today.

Our suggestion is therefore that E. praecursor and E. dubius are synonyms. We prefer to preserve the name E. dubius, since it is being used for the Quercy populations. E. praecursor is then a synonym of E. du-

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**Plate 1.**

*Pseudocricetodon* sp. from Montalbán 3C
Fig. 1. M1 sin., ML B3C 61
Fig. 2. M2 sin., ML B3C 62
Fig. 3. M3 sin., ML B3C 64

*Pseudocricetodon montalbanensis* Thaler, 1969 from Montalbán 1D
Fig. 4. M1 sin., ML BID 208
Fig. 5. M2 sin., ML BID 444
Fig. 6. M3 sin., ML BID 504
**REMARKS ON PSEUDOCRICETODON**

In discussions on the phylogeny of *Pseudocricetodon* it is frequently assumed, that *E. moguntiacus* Bahlo, 1975 from Heimersheim be a descendant of *P. montalbanensis* Thaler, 1969. Thanks to Drs Schmidt-Kittler and Hugueney we had the opportunity to study a collection from Heimersheim; Dr Hugueney had already made a separation of this material into various groups, which made our study a lot easier. We came to the following conclusions:

Bahlo (1975) described over 250 specimens of *E. moguntiacus*, and less than 20 specimens of what he called *Eucriocetodon atavus*. Freudenthal (1988) demonstrated, that this *Eucriocetodon* is not *E. atavus*. We found a much higher frequency of this *Eucriocetodon*, and think, that a considerable part of Bahlo’s *E. moguntiacus* collection belongs to his “*E. atavus*”). The remaining *E. moguntiacus* material belongs to two different species of *Pseudocricetodon*, distinguished by their size, and some minor morphological details.

The supposed lineage *P. montalbanensis-moguntiacus* cannot be confirmed nor rejected, until the Heimersheim material be revised in more detail, and the two *Pseudocricetodon* species separated, and morphologically defined. The name *E. moguntiacus* is based on the holotype HLM/Hlm 595, one of the smallest M₂; after dividing the material on the basis of dimensions into two groups, *P. moguntiacus* is roughly of the same size as *P. montalbanensis*. Because of some morphological differences we don’t think the two species are identical.

In the M₁ and M₂ of *P. moguntiacus* the protoconid hind arm is longer and more detached from the metaconid than in *P. montalbanensis*. The mesolophid is on the average shorter and of a simpler structure, the ectomesolophid is less developed. The mesoloph of *M₁* and *M₂* is on the average shorter than in *P. montalbanensis*.

**PSEUDOCRICETODON SP. NOV.**

So far, the classic level of Montalbán (MLB 1D in our terminology), was the oldest occurrence of *Pseudocricetodon*. We found, however, an obviously new species of this genus in a level slightly lower than the classic one. The material is very poor (1 M₁, 2 M₂ and 2 M₃). Its highly complicated morphology proves that at this level already there must have been at least two lineages of *Pseudocricetodon*, because the new species can by no means be an ancestor of *P. montalbanensis* from MLB 1D, which shows a much more simple morphology. In view of the scarcity of the material we refrained from naming a new species.

**Locality:** Montalbán 3C  
**Material:** (measurements in units of 0.1 mm) M₁ sin., MLB3C 61, 12.3 × 8.5; M₂ sin., MLB3C 62, 11.5 × 9.8; M₃ dext., MLB3C 63, 11.2 × 9.7; M₁ sin., MLB3C 64, 10.7 × 8.7: M₁ dext., MLB3C 65, 10.7 × 8.5.

This material will be incorporated in the collections of the Departamento de Ciencias de la Tierra, Universidad de Zaragoza.

**Description.**

M₁: The anteroconid is a transverse crest, the lingual anterolophid closes the anterosinusid; there is a low metalophulid; the hind arm of the protoconid is long, and reaches the metaconid at mid-height. There is a small mesoconid, that bears a mesolophid of medium length, directed towards the protoconid hind arm. The mesoconid bears a second crest, directed posteriorly, that branches into three crests. There is a long and high hypoconid hind arm, that is strongly connected to the entoconid.

M₂: The protoconid hind arm is long, and ends freely in the mesosinusid. Mesoconid and mesolophid are as complex as in M₁, and there is a very strong ectomesolophid. The ectolophid is low, almost interrupted, between mesoconid and hypolophulid. There is no hypoconid hind arm. In the second specimen the mesoconid is somewhat less complex, and the ectolophid is higher.

M₃: The metalophulid is interrupted, and bears various posterior spurs. The protoconid hind arm is very long, and ends freely. There is no mesoconid, the mesolophid is short, the ectomesolophid very strong. The ectolophid is interrupted between protoconid and mesolophid. In the second specimen the protoconid hind arm is shorter, and the ectolophid is low, but not interrupted.

This species differs from all other species of *Pseudocricetodon* by its very complex dental morphology, specially the complex structure of the mesolophid in *M₁* and *M₂*, the presence of a well developed hypoconid hind arm in *M₁*, and by the nearly or completely interrupted ectolophid in *M₂* and *M₃*. It is furthermore characterized by very well developed ectomesolophids in *M₂* and *M₃*.

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We wish to thank Dr G. Cuenca Bescós (Zaragoza) for her help on many levels, that made the excavations in Montalbán possible.

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allowed us to study Oligocene cricetid material in the collections of the University of Lyon, and put many of her own observations at our disposal, and to Dr N. Schmidt-Kittler (Mainz), who allowed us to study cricetid material from Heimersheim.

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