Miscellaneous Gliridae from the Miocene of the Calatayud-Teruel Basin, Aragón, Spain

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Several small Gliridae assemblages from the Aragonian and Ramblian type areas are described. Two new species are defined: *Pseudodryomys julii* and *Tempestia ovilis*.

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Introduction

This paper forms part of a series of papers on the micromammal fauna of the Ramblian and Aragonian type-areas (Calatayud-Teruel Basin, provinces of Zaragoza and Teruel). Most of the material (RGM numbers) has been collected by Daams & Freudenthal and their team during the years 1976-1983, and is stored in the Rijksmuseum van Geologie en Mineralogie at Leiden (The Netherlands). Detailed studies on these faunas have been published recently (Freudenthal, 1988, ed.).

The material from Artesilla was collected by J. Morales in 1986; it is stored at the Museo Nacional de Ciencias Naturales, Madrid (ART numbers).

The microfauna of Artesilla has not yet been published. The locality is situated near Villafeliche, and it lies below the fossiliferous level of Vargas 1A. It is the lowest locality in the Aragonian type area with *Megacricetodon*, but it has very few Eomyidae in contrast with the frequent occurrence of *Ligerimys ellipticus* Daams, 1976 in other localities of about the same stratigraphic level. At present the fauna is being studied by various students.

The measurements of the teeth have been made using an Orthoplan measuring microscope (ocular 8 x, objective 4 x) with mechanical stage and measuring clocks (RGM numbers), or with a Nikon digital measuring microscope (ART numbers). The nomenclature of parts of the Gliridae cheek teeth is after Daams (1981), and the measurements are given in 0.1 mm units. For the situation of the localities, the reader is referred to Daams & Freudenthal (1988), and Daams et al. (1987).

Systematic descriptions

GLIRIDAE Thomas, 1897
MYOMIMINAE Daams, 1981
Tempestia van de Weerd, 1976

Tempestia ovilis sp. nov.
Pl. 1, figs. 1-6.

Holotype – M^2 dext., RGM 301 173, Pl. 1, fig. 2.
Type-locality – Las Planas 5B, prov. of Zaragoza.
Type-level – Zone G1 (Upper Aragonian).
Derivatio nominis – Genitive of ovile, Latin for sheep-fold, because the locality of Las Planas 5B is situated near the sheep-fold of Las Planas, near Villafeliche, Zaragoza.

Diagnosis – *Tempestia* with a long isolated anterior centroloph and a short posterior centroloph in $M^{1,2}$. The trigone has a sharp V-shaped pattern.

Differential diagnosis – *Tempestia ovilis* sp. nov. differs from *T. hartenbergeri* (de Bruijn, 1966) from the Vallesian by its slightly smaller size, and by the presence of a small posterior centroloph in $M^{1,2}$.

Locality Las Planas 5B (Zone G1, Upper Aragonian)

Description

D^4 – (9.2 x 9.7) The anteroloph and posteroloph are isolated ridges. Protoloph and metaloph form a Y-pattern. Centrolophs are absent.

M^2 – (12.7 x 15.3) The anteroloph and posteroloph form isolated ridges. Protoloph and metaloph form a slightly oblique V-shaped pattern. The anterior centroloph is a well-developed, long and isolated ridge. The posterior centroloph is a short isolated ridge.

M^3 – (9.8 x 12.6) The anteroloph is connected to the protocone. Protoloph and metaloph form a pointed V-pattern. The anterior centroloph is short and isolated, the

posterior centroloph is long and also isolated. The posteroloph is separated from the metacone, and it is connected to the protocone.

M_2 – (13.4 x 14.4) The anterolophid is separated from the protoconid. The centrolophid is of medium length, and connected to the mesolophid. The mesolophid joins the posterolophid at the entoconid.

Locality Regajo 2 (Zone D3, Middle Aragonian)

M^2 – (12.8 x 15.3) This specimen agrees basically with the holotype, although the short posterior centroloph is connected to the metacone and the posteroloph joins the protocone.

Locality Valalto 2C (Zone F, Upper Aragonian)

M^2 – (12.6 x 15.9) In this specimen the anteroloph is connected to the base of the paracone, the short posterior centroloph joins the metacone, and the posteroloph meets the protocone.

Tempestia hartenbergeri (de Bruijn, 1966)
Pl. 1, figs. 7-8.

Locality Carrilanga 1 (Zone I, Lower Vallesian)

M^1 – (13.5 x 14.4) The anteroloph is an isolated ridge. Protoloph and metaloph form a slightly oblique Y-pattern. A short isolated centroloph is present, which is as wide as the main ridges. The posteroloph is connected to the protocone, and separated from the metacone.

Locality Alcocer 2 (Zone G3, Upper Aragonian)

M^3 – (9.3 x 12.9) The anteroloph is an isolated ridge. Protoloph and metaloph form a slightly oblique Y-pattern. A short, isolated centroloph is situated at the labial border. The posteroloph is an isolated ridge.

Discussion – *Tempestia* is a rare representative of the Myomiminae in the Aragonian and Vallesian of Spain, and therefore its morphological variation is not yet known. In *T. ovilis* the metaloph and protoloph of $M^{1,2,3}$ meet more or less at the protocone, thus forming a relatively pointed V-pattern. In *T. hartenbergeri* these two ridges meet more in the centre of the tooth, thus forming a Y-pattern. Both species have the long, well-developed centroloph in common, which has a nearly central position in *T. ovilis* already.

T. ovilis is present in Regajo 2 (zone D3), Valalto 2C (zone F) and Las Planas 5B (zone G1), and consequently covers a relatively long time range. Its range coincides with the dry climatic conditions of this period. *T. ovilis* is probably the ancestor of *T. hartenbergeri.*

Pseudodryomys de Bruijn, 1966

Pseudodryomys julii sp. nov.
Pl. 2, figs. 1-7.

Holotype – M^1 dext., ART 4, Pl. 2, fig. 1.
Type-locality – Artesilla, near Villafeliche, prov. of Zaragoza.
Type-level – Zone C (Lower Aragonian).
Derivatio nominis – In honour of Julio García from Villafeliche, the discoverer of the type-locality.

Diagnosis – A small *Pseudodryomys* species with a flat to slightly convex occlusal surface. The $M^{1,2}$ have a subquadrate circumference. Simple dental pattern. Centrolophs are absent, and centrolophids are short or absent. Protoloph and metaloph form a Y-pattern in $M^{1,2}$.

Differential diagnosis – *P. julii* sp. nov. differs from *P. robustus* de Bruijn, 1966 and *P. simplicidens* de Bruijn, 1966 from the Lower Miocene of Spain by its significantly smaller size, and by the more reduced centrolophid.

P. julii sp. nov. differs from *P. ibericus* de Bruijn, 1966 from the Lower Miocene of Spain by its smaller size, by the absence of centrolophs and extra ridges, and by the reduced centrolophid.

P. julii sp. nov. differs from *Peridyromys murinus* (Pomel, 1853) from the Lower Miocene of Spain by its somewhat greater length, by the subquadrate shape of $M^{1,2}$, by the absence of centrolophs, by the more reduced centrolophid and by its flat to convex occlusal surface.

Material and measurements

	Length				Width			
	n	min.	mean	max.	n	min.	mean	max.
M^1	8	10.6	10.9	11.1	8	10.4	11.1	11.7
M^2	4	9.7	10.1	10.3	4	10.0	10.9	11.5
M^3	1	–	7.9	–	1	–	10.3	–
M_1	6	10.1	10.7	11.5	6	9.1	9.7	10.7
M_2	8	9.9	10.6	11.1	9	9.9	10.4	11.2

Plate 1

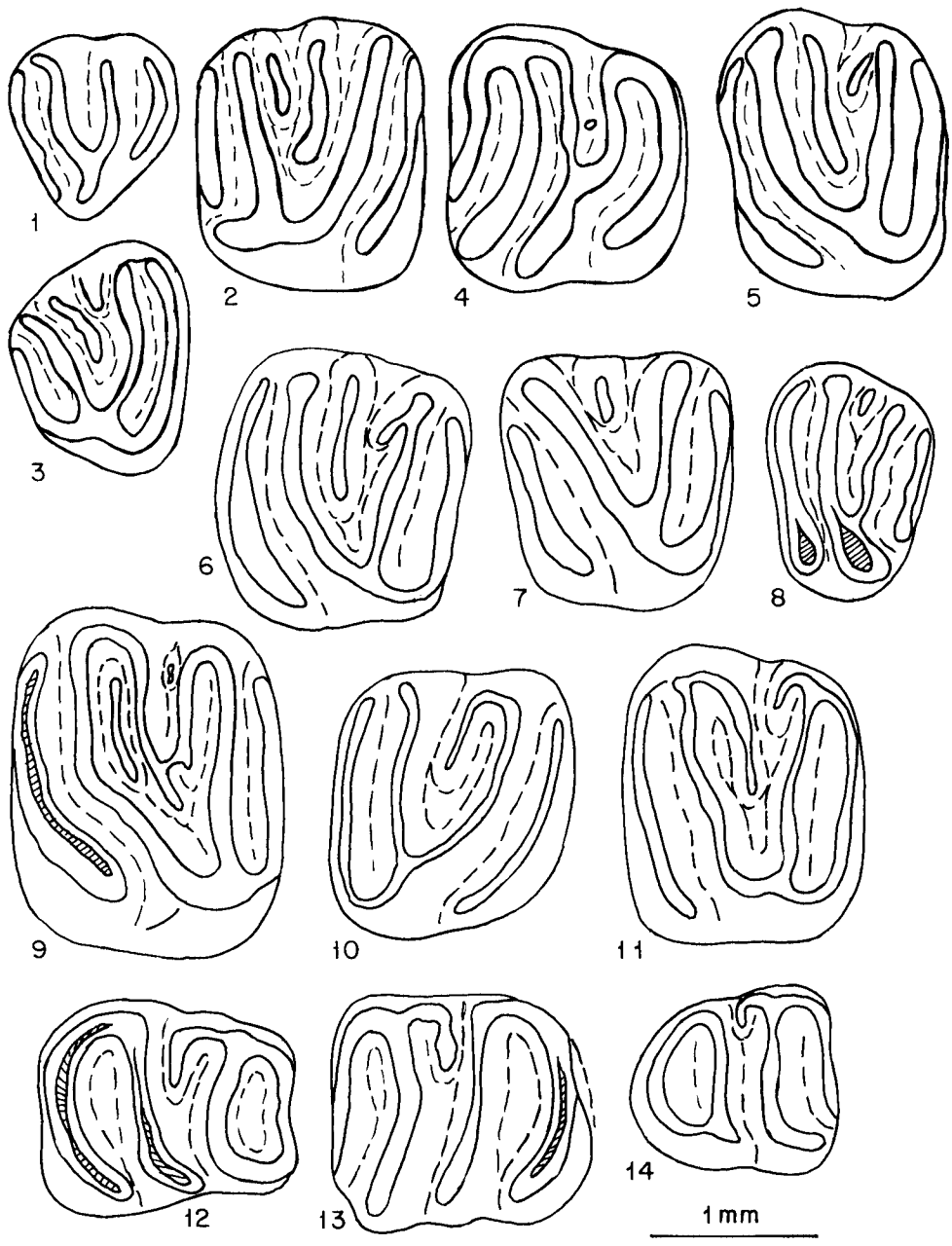
Tempestia ovilis sp. nov.
Fig. 1. D^4 dext., RGM 301 172, Las Planas 5B.
Fig. 2. M^2 dext., RGM 301 173, Las Planas 5B, holotype.
Fig. 3. M^3 dext., RGM 301 174, Las Planas 5B.
Fig. 4. M_2 sin., RGM 301 175, Las Planas 5B.
Fig. 5. M^2 sin., RGM 253 450, Valalto 2C.
Fig. 6. M^2 sin., RGM 337 606, Regajo 2.

Tempestia hartenbergeri (de Bruijn, 1966)
Fig. 7. M^1 sin., RGM 337 608, Carrilanga 1.
Fig. 8. M^3 sin., RGM 255 435, Alcocer 2.

Peridyromys rex García Moreno, 1986 from Valhondo 4E
Fig. 9. M^2 sin., RGM 337 603.

Altomiramys daamsi Díaz Molina & López Martínez, 1979 from Ramblar 1
Fig. 10. M^1 dext., RGM 336 031.
Fig. 11. M^2 sin., RGM 336 050.
Fig. 12. M_1 dext., RGM 336 024.
Fig. 13. M_2 sin., RGM 337 601.
Fig. 14. M_3 dext., RGM 337 602.

Plate 1



Description

$M^{1,2}$ – Occlusal surface flat to convex. Only the four main ridges are present. The anteroloph is more or less straight and transverse, and descends at 1/3 from the lingual border to end far below the protocone (Pl. 2, fig. 1b). The protocone is high and wide. Meta- and protoloph form a Y-pattern. Paracone and metacone are relatively small and low cusps. The metaloph is separated from the protoloph in 1 out of 12 specimens. The posteroloph is a low and isolated ridge.

M^3 – The anteroloph is straight and transverse; it ends freely at the lingual border, and labially it joins the paracone. Protoloph and metaloph meet at the lingual border. The posteroloph is labially isolated, and lingually it is separated from the protocone by a narrow and shallow furrow.

M_1 – The four main ridges are present. The anterolophid is separated from the protoconid, and it is connected to the metaconid. The centrolophid consists of a short longitudinal elongation of the metaconid in 4 specimens, and in 2 cases it is absent. Mesolophid and posterolophid meet at the entoconid, although this connection may be low.

M_2 – The dental pattern corresponds basically with that of M_1. The anterolophid is shorter than in M_1, and it is separated from the protoconid. A posterior elongation of the metaconid points at the presence of a small centrolophid. One specimen lacks a centrolophid, and another one has an endolophid.

Discussion – *P. julii* sp. nov. clearly belongs to the *P. simplicidens* - *P. robustus* group because of its simple dental pattern and the relatively flat occlusal surface. Discrete features of *P. julii* are among others the low anteroloph and low posteroloph, the subquadrate outline of $M^{1,2}$, and the reduced centrolophid of $M_{1,2}$.

Daams (1981) mentions the presence of 4 M^1 in Villafeliche 2A (fig. 15, p. 37) without centrolophs and considers them to fall within the range of variation of *P. murinus*. These specimens should probably be assigned to *P. julii*.

Peridyromys Stehlin & Schaub, 1951

Peridyromys aff. *jaegeri* Aguilar, 1974
Pl. 2, figs. 8-17.

Material and measurements

	Length				Width				
	n	min.	mean	max.	n	min.	mean	max.	Locality
$M^{1,2}$	3	11.3	11.8	12.3	2	13.1	13.6	14.0	Olmo Redondo 9
$M^{1,2}$	3	11.2	11.3	11.4	1	–	12.8	–	Olmo Redondo 8
$M^{1,2}$	5	10.9	11.4	12.2	3	12.6	13.0	13.5	Olmo Redondo 5
M^3	1	–	9.5	–	1	–	11.9	–	Olmo Redondo 8
M^3	1	–	8.6	–	1	–	12.1	–	Olmo Redondo 5
M_1	1	–	12.0	–	–	–	–	–	Olmo Redondo 9
M_1	1	–	12.5	–	–	–	–	–	Olmo Redondo 8
M_1	2	11.9	12.3	12.6	2	10.5	10.8	11.1	Olmo Redondo 5
M_2	1	–	12.2	–	1	–	11.6	–	Olmo Redondo 9
M_2	2	12.1	12.3	12.4	2	12.2	12.6	13.0	Olmo Redondo 8
M_2	1	–	12.7	–	1	–	12.2	–	Olmo Redondo 5
M_3	1	–	12.0	–	1	–	10.7	–	Olmo Redondo 8
M_3	1	–	12.6	–	1	–	11.8	–	Olmo Redondo 5

Locality Olmo Redondo 5 (Zone C, Lower Aragonian)

Description

$M^{1,2}$ – Concave occlusal surface. The anteroloph is lingually isolated, and labially it joins the basis of the paracone. Both in M^1 and M^2 protoloph and metaloph form an oblique V-pattern. Two centrolophs are present, which tend to fuse in the central valley. In 3 specimens the posterior centroloph is longer than the anterior one, in 2 specimens the anterior one is longer, and in 1 specimen this feature is not distinct because the centrolophs are fused. The posteroloph joins both metacone and protocone. Five out of 6 specimens have an extra ridge between the protoloph and the anterior centroloph. One specimen has an extra ridge between the posterior centroloph and the metaloph.

M^3 – A complete endoloph is present. Labially the anteroloph joins the paracone. A long anterior centroloph and a long posterior one are present. These two ridges fuse in the lingual part of the central valley. The posteroloph is labially isolated.

M_1 – The anterolophid is separated from the protoconid. The metalophid joins the metaconid. The centrolophid is long without reaching the labial border of the molar. In 1 specimen this ridge meets the posterior wall of the protoconid. In the same specimen a narrow ridge connects the labial end of the centrolophid to the antero-lingual wall of the mesoconid. The mesolophid meets the posterolophid at the entoconid. One extra ridge is present at either side of the centrolophid. One specimen has a tiny extra ridge in the posterior valley, which is connected to the mesolophid. The other specimen lacks an accessory ridge in the posterior valley.

M_2 – The anterolophid is connected to the protoconid. The metalophid is separated from the metaconid. The long centrolophid meets the metalophid at 25 % of the molar width from the labial border. At either side of the centrolophid a small cusp-like extra ridge is present.

M_3 – The anterolophid is separated from the protoconid. The metalophid meets the metaconid. The long centrolophid meets the postero-lingual wall of the protoconid. Mesolophid and posterolophid meet at the entoconid. An extra ridge is situated in the anterior valley, and another one in the posterior valley.

Locality Olmo Redondo 8 (Zone C, Lower Aragonian)

Description

$M^{1,2}$ – The anteroloph is connected to the paracone. The trigone forms an oblique V-pattern, which is sharper in M^1 than in M^2. The long anterior centroloph is longer than the posterior one, and they do not fuse. The posteroloph joins protocone and metacone respectively. All 5 specimens have an extra ridge between the protoloph and the anterior centroloph. In 1 of these specimens the extra ridge is double. One specimen has an extra ridge at either side of the posterior centroloph.

M^3 – The anteroloph ends freely at the lingual border, and labially it joins the paracone. The long anterior centroloph meets the metaloph at its lingual end, and it is longer than the posterior centroloph. The posteroloph is connected to protocone and metacone. A long accessory ridge is present between the protoloph and the anterior centroloph.

M_1 – This specimen is unfortunately too damaged to allow a reliable description.

M_2 – Anterolophid and protoconid meet below the occlusal surface. The metalophid does not meet the metaconid. The length of the centrolophid is 60-70 % of the molar width, and in 1 specimen it is interrupted. Mesolophid and posterolophid meet at the entoconid. All 3 specimens have an extra ridge in the anterior valley,

one at either side of the centrolophid, and one in the posterior valley.

M_3 – The anterolophid joins the protoconid. The metalophid does not meet the metaconid. The length of the centrolophid is 60-70 % of the molar width. Meso- and posterolophid meet at the entoconid. One extra ridge is present in the anterior valley, and one in the posterior valley.

Locality Olmo Redondo 9 (Zone D1, Middle Aragonian)

Description

$M^{1,2}$ – In 1 specimen the anterior centroloph is longer than the posterior one, in 1 specimen this is the reverse, and in the other case these two ridges are fused in the central valley. An extra ridge is present between the protoloph and the anterior centroloph. Two specimens have an extra ridge between the anterior and posterior centroloph, and all 3 specimens have an extra ridge between posterior centroloph and metaloph.

M_1 – The labial part of the only specimen is damaged. The metalophid does not reach the metaconid. One extra ridge is present at either side of the centrolophid, and a third one in the posterior valley.

M_2 – The anterolophid is separated from the protoconid, and the metalophid from the metaconid. The long centrolophid joins the antero-lingual wall of the mesoconid by means of a narrow and low ridge. The labial ends of mesolophid and posterolophid meet at the labial tooth border, thus closing the posterior valley. Four extra ridges are present: one in the anterior valley, one at either side of the centrolophid, and one in the posterior valley. The posterior extra ridge meets the labial wall.

Discussion – *Peridyromys* aff. *jaegeri* from Olmo Redondo 5, 8, and 9 has somewhat larger teeth than *P. jaegeri* from the Lower Miocene of Les Cévennes (type-locality) and La Paillade (Aguilar, 1974). These localities are correlatable with our Zone X by the presence of *Rhodanomys schlosseri* Depéret & Douxami, 1902 (see Alvarez, 1987). Morphologically our material falls within the variation of the French species. Common features are:
The anterior centroloph may be longer or shorter than the posterior one.
The number of extra ridges in $M^{1,2}$ varies from 1 to 3.
The long centrolophids of the lower molars.

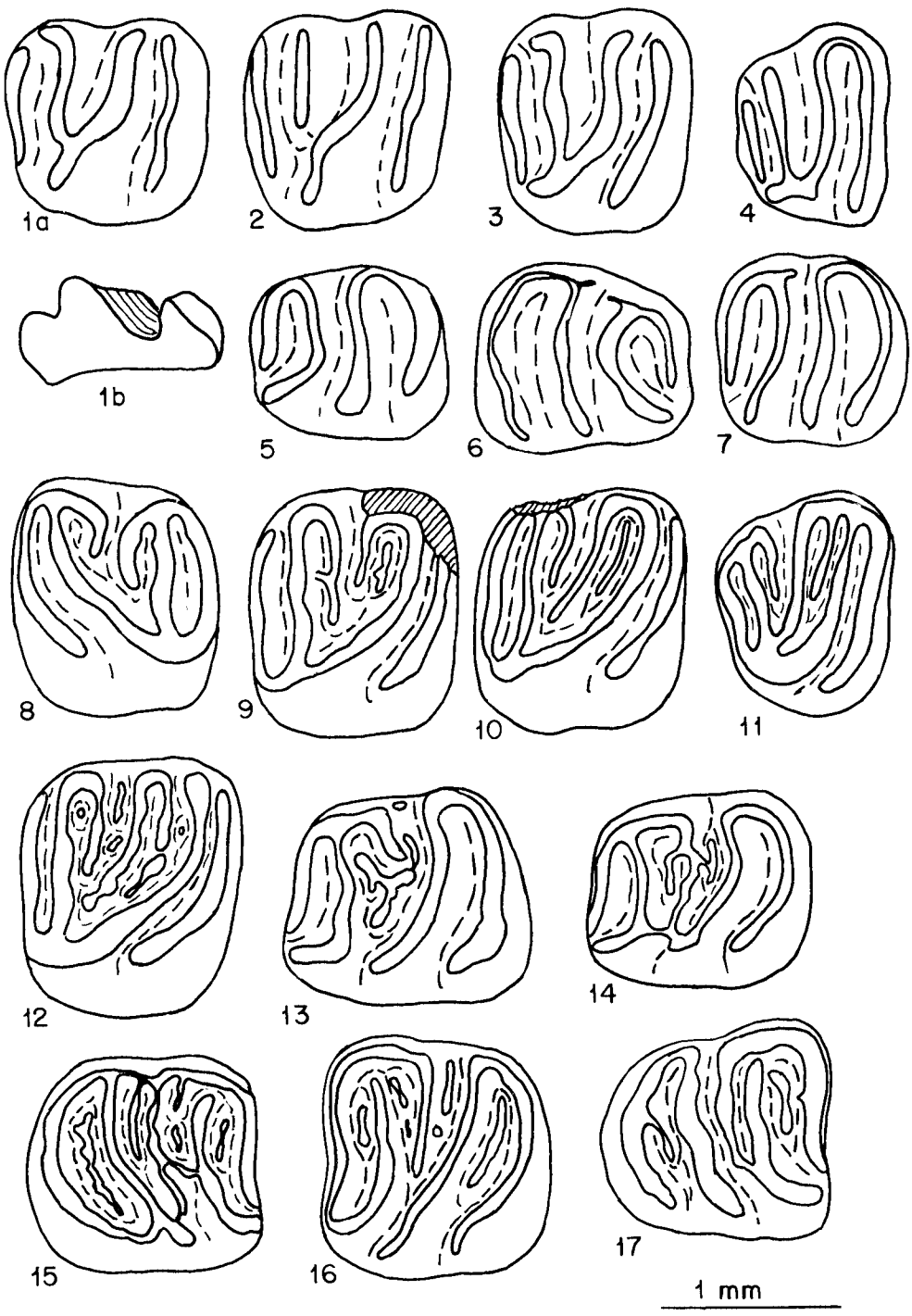
Although the assemblages from Olmo Redondo 5, 8, and 9 are small, one can observe a difference between the one from Olmo Redondo 5, and the other two assemblages. This difference consists of the more simple dental pattern of *P.* aff. *jaegeri* from

Plate 2

Pseudodryomys julii sp. nov. from Artesilla
Fig. 1a. M^1 dext., ART 4, holotype.
Fig. 1b. idem, lingual view.
Fig. 2. M^1 dext., ART 6.
Fig. 3. M^2 dext., ART 20.
Fig. 4. M^3 dext., ART 21.
Fig. 5. M_1 sin., ART 7.
Fig. 6. M_1 dext., ART 22.
Fig. 7. M_2 sin., ART 23.

Peridyromys aff. *jaegeri* Aguilar, 1974
Fig. 8. M^2 sin., RGM 303 894, Olmo Redondo 5.
Fig. 9. $M^{1,2}$ dext., RGM 303 896, Olmo Redondo 5.
Fig. 10. $M^{1,2}$ dext., RGM 333 934, Olmo Redondo 8.
Fig. 11. M^3 dext., RGM 333 938, Olmo Redondo 8.
Fig. 12. M^2 dext., RGM 336 450, Olmo Redondo 9.
Fig. 13. M_1 sin., RGM 303 898, Olmo Redondo 5.
Fig. 14. M_1 sin., RGM 303 899, Olmo Redondo 5.
Fig. 15. M_3 dext., RGM 337 600, Olmo Redondo 5.

Plate 2



Olmo Redondo 5. Both M_1 and M_2 practically lack the posterior extra ridge, whereas in the anterior part of the tooth accessory ridges are present. This feature is absent in *P. jaegeri*, and any other glirid species.

Peridyromys rex García Moreno in Alvarez Sierra & García Moreno, 1986
Pl. 1, fig. 9.

Locality Valhondo 4E (Zone D3, Middle Aragonian)

Description

M^2 (15.5 x 19.1) Concave occlusal surface. The anteroloph is an isolated ridge. The trigone has an oblique V-shape. The anterior centroloph is longer than the posterior one. The posterior centroloph is fused to the anterior one, thus forming a Y-pattern. A long extra ridge is present between protoloph and anterior centroloph. The posteroloph is labially isolated, and lingually connected to the protocone.

Discussion – The only tooth of *P. rex* present in Valhondo 4E falls within the variation of size and dental pattern of the same species from its type-locality Torremormojón 6B (Upper Aragonian, Duero Basin).

Altomiramys Díaz Molina & López Martínez, 1979

Altomiramys daamsi Díaz Molina & López Martínez, 1979
Pl. 1, figs. 10-14.

Locality Ramblar 1 (Zone Z, Lower Ramblian)

Description

P^4 – (9.9 x 11.4; 9.3 x 10.9) The anteroloph ends freely at the lingual border. Labially it is connected to the paracone in 1 specimen, and in the other specimen this part of the tooth is damaged. Protoloph and metaloph are transverse ridges that meet at the lingual border, thus forming a compressed U-pattern. The posteroloph is well developed in 1 specimen, in which it joins the metacone labially, and the base of the protocone lingually. In the other specimen it is a short, labially situated ridge.

$M^{1,2}$ – (M^1: 13.2 x 14.9 and 13.4 x 15.0; M^2: 13.8 x 16.7, 14.5 x –, and – x 15.3.) The generally isolated anteroloph ends far below the protocone at the lingual border. In 1 M^2 the anteroloph is labially connected to the base of the paracone. The anterior centroloph is connected to the paracone, and it extends halfway into the central valley. Posterior centrolophs are absent in M^1, but 1 M^2 has a tiny one that joins the metacone. In M^1 metaloph and protoloph join labially of the protocone, thus forming an oblique Y-pattern. In M^2 these ridges join at the lingual border. One M^2 has a small extra ridge behind the lingual end of the anterior centroloph. The posteroloph of M^1 joins the base of the protocone, and ends freely at the labial border. In M^2 the posteroloph is connected to protocone and metacone.

M_1 – (14.1 x 11.9) Long and narrow tooth. The anterolophid is low and narrow, and it joins the protoconid. The metalophid joins the metaconid, and towards the labial border it curves forward to meet the anterolophid. The centrolophid extends along the lingual border, and curves at a right angle into the central valey, where it

covers about 1/3 of the tooth width. Mesolophid and posterolophid meet at the entoconid. This element has two roots.

M_2 – (14.1 x 13.1) The anterolophid does not meet the protoconid. The centrolophid is of the same shape as in M_1, and the rest of the dental pattern corresponds also to that of M_1.

M_3 – (11.4 x 10.5) The anterolophid is separated from the protoconid. The centrolophid is shorter than in $M_{1,2}$. Mesolophid and posterolophid meet at the lingual border.

Discussion – Although the holotype (and until now unique specimen) of *Altomiramys daamsi* is of somewhat larger dimensions than our material, there is little doubt in assigning our material from Ramblar 1 to this species.

In Ramblar 1 both *Pseudodryomys simplicidens* de Bruijn, 1966 and *P. ibericus* de Bruijn, 1966 are present, both of smaller size than *Altomiramys daamsi*. Moreover, *P. simplicidens* lacks the well-developed anterior centroloph and the angular centrolophid of *A. daamsi*. *P. ibericus* has a considerably more complicated dental pattern.

Daams (1974) described material of *P. ibericus* and *P. simplicidens* from Cetina de Aragón. He considered the latter species from this locality to fall within the morphological variation of *P. simplicidens*, although it is characterized by the presence of a well-developed anterior centroloph in $M^{1,2}$. I now prefer to consider *P. simplicidens* to be characterized by the absence of centrolophs or by the presence of a small posterior one only. *'P. simplicidens'* from Cetina is probably the ancestor of *A. daamsi* and should be referred to as *Altomiramys* aff. *daamsi*, as it is only somewhat smaller. In Cetina 23 % of the $M^{1,2}$ are teeth with the anterior centroloph only, 23 % of the M_1 and 23 % of the M_2 lack extra ridges. These teeth are now considered to belong to *A.* aff. *daamsi*.

DRYOMYINAE de Bruijn, 1967
Eliomys Wagner, 1840

Eliomys cf. *truci* Mein & Michaux, 1970
Fig. 1d.

Locality Solera (Zone G3, Upper Aragonian)

Description

M^2 – (11.8 x 15.2) Concave occlusal surface. The anteroloph is connected to the protocone, thus forming a continuous endoloph. The anteroloph is labially connected to the base of the paracone. The long centroloph is connected to the posterior base of the paracone. Between the protoloph and the centroloph a very slight elevation of the enamel indicates the presence of a small extra ridge. The posteroloph is connected to the base of the metacone.

Discussion – This specimen presents nearly all the characteristics of the type-material of *E. truci* from Hautimagne. A long centroloph, an endoloph, and a rectangular shape are shared features. The specimen from Solera is however larger. Its size coincides with that of *E. truci* from the older localities in the Teruel-Alfambra region (van de Weerd, 1976), but not with that in the younger ones, where *E. truci* has relatively small teeth. The specimen from Solera shares its general morphology with that of *Microdyromys monspeliensis* Aguilar, 1977, but its large size and rectangular shape fit better with those of *E. truci*.

Paraglirulus Engesser, 1972

Paraglirulus werenfelsi Engesser, 1972
Fig. 1a-1c, 1e-1h.

Locality Las Planas 4C (Zone E, Middle Aragonian)

Description

D^4 – (9.7 x 10.1) A short anteroloph is present, which is separated from both paracone and protoloph by narrow and shallow furrows. The anterior centroloph is narrow, and shorter than the posterior one. A long extra ridge is present between the posterior centroloph and the metaloph. The posteroloph is separated from the metacone by a narrow furrow.

M^1 – (11.9 x 11.9) The anterior part of the tooth is damaged. Protoloph, anterior centroloph, metaloph and posteroloph meet the endoloph separately. The anteroloph is connected to the paracone, the anterior centroloph ends freely at the labial border, the posterior centroloph is a short isolated ridge, and the posteroloph meets the metacone. Three extra ridges are present: one between the anteroloph and the protoloph, one between the protoloph and the anterior centroloph, and one in the posterior valley. These extra ridges are narrower and lower than the main ridges.

M^2 – (- x 12.3) This specimen also has a damaged anterior part; its dental pattern agrees with that of M^1.

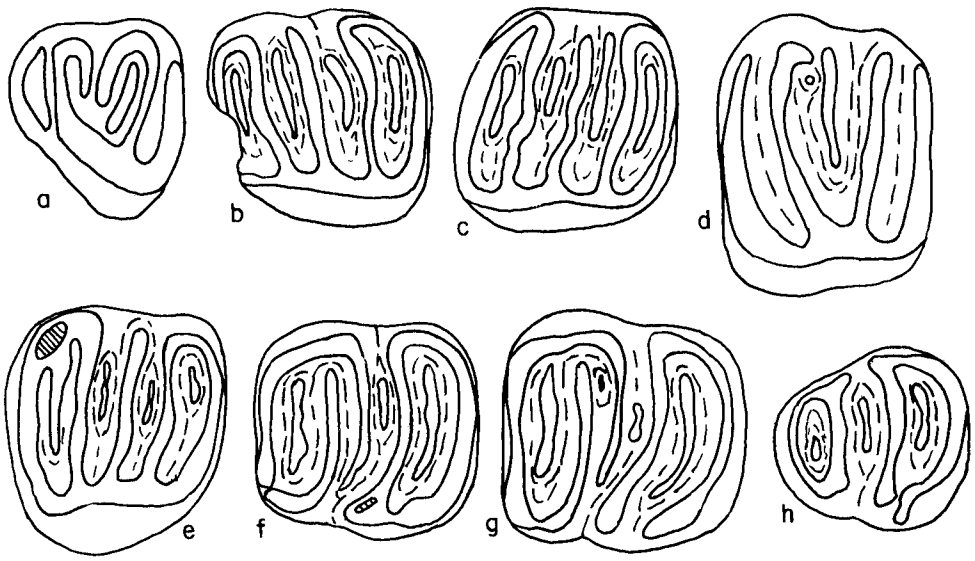


Fig. 1. *Paraglirulus werenfelsi* from Las Planas 4C
a: D^4 sin., RGM 266 123; b: M^1 sin., RGM 266 125; c: M^2 dext., RGM 266 124.
Paraglirulus werenfelsi from Valalto 2C
e: M^1 dext., RGM 253 442; f: M_1 sin., RGM 253 444; g: M_2 sin., RGM 253 446; h: P_4 sin., RGM 253 447.
Eliomys cf. *truci* from Solera: d: M^2 sin., RGM 337 607.

Locality Valalto 2C (Zone F, Upper Aragonian)

Description

$M^{1,2}$ – (M^1: 11.7 x 12.7; M^2: 13.4 x 14.3) The dental pattern of these elements corresponds basically to that of the specimens from Las Planas 4C. In M^2 the extra ridge between protoloph and anterior centroloph is connected to the base of the paracone, and the posterior centroloph is relatively long.

P_4 – (10.1 x 8.9) The anterolophid joins the protoconid. The centrolophid is an isolated ridge. The labial ends of mesolophid and posterolophid are separated by a narrow furrow. A short anterior extra ridge, and a well-developed posterior one are present.

M_1 – (12.2 x - ; 11.9 x 10.8; 11.9 x -) The anterolophid is connected to the protoconid, and the metalophid is separated from the metaconid. The centrolophid is long, but it does not reach the labial border. The labial end of the posterolophid joins that of the mesolophid slightly below the occlusal surface. Three extra ridges are present; one in the anterior valley, a tiny one behind the centrolophid, and a long one in the posterior valley. The anterior and posterior accessory ridges are approximately of the same width as the main ridges.

M_2 – (13.1 x 12.8) This element has basically the same dental pattern as M_1, although an additional extra ridge is present behind the metalophid. The labial ends of mesolophid and posterolophid do not meet.

Discussion – Size and dental pattern of *Paraglirulus werenfelsi* from Las Planas 4C and Valalto 2C agree with those of the same species from Anwil, Sansan and Can Llobateres. In all of the five mentioned localities this species is present in low frequencies. The species has a long stratigraphic range: from Zone E (Middle Aragonian) of Las Planas 4C to Zone I (Lower Vallesian) of Can Llobateres. The material of Las Planas 4C is so far the oldest record of this species.

Bransatoglis Hugueney, 1967

Bransatoglis? sp.
Fig. 2.

Locality Ramblar 1 (Zone Z, Lower Ramblian)

Description

M^3 – (14.7 x 16.4) Low-crowned with a very concave occlusal surface. Low and wide ridges. The anteroloph joins the proto- and metacone respectively. Protoloph and metaloph form a wide V-pattern. The anterior centroloph is a long and isolated ridge. The posterior centroloph is longer; lingually it ends freely, and labially it joins the metacone. The posteroloph is connected to protocone and metacone. A short extra

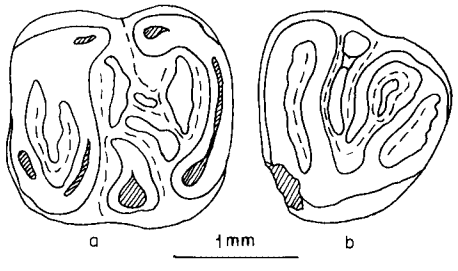


Fig. 2. *Bransatoglis?* sp. from Ramblar 1 a: M_1 sin., RGM 337 604; b: M^3 sin., RGM 337 605.

ridge is present in the anterior valley, and a longer one between the posterior centroloph and the metaloph.

M_1 – (17.3 x 16.7) Very concave occlusal surface. The metaconid is high and big, and the entoconid, mesoconid and hypoconid are distinct cusps. The dental pattern consists of a chaotic network of ridges (Fig. 2a).

M_2 – Only a postero-lingual fragment is present. It is characterized by a very concave occlusal surface, a high and big metaconid and a distinct entoconid. The metalophid joins the metaconid. The centrolophid, mesolophid and posterior extra ridge are lower and narrower than the posterolophid. The centrolophid does not join the metaconid.

Discussion – In the distribution charts by Daams & Freudenthal (1981, 1988) and Daams et al. (1987) these specimens are referred to as *Bransatoglis* Hugueney, 1967. This genus is among other features characterized by its very concave occlusal surface, wide and blunt ridges and shallow and narrow valleys. The wide trapezoidal shape of M^3 is also a typical feature of this genus. Our material from Ramblar 1 is however not sufficient to assign it with certainty to this genus, and is therefore named *Bransatoglis?* sp.

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