The micromammal fauna from the Upper Oligocene of Sayatón 6, Madrid Basin, prov. of Guadalajara, Spain

Remmert Daams

Daams, R. The micromammal fauna from the Upper Oligocene of Sayatón 6, Madrid Basin, prov. of Guadalajara, Spain. – Scripta Geol., 89: 57-69, 3 figs., 2 pls, Leiden, July 1989.

The extremely poor rodent fauna of Sayatón 6 is described. Only three species are present, of which two are new: *Adelomyarion alberti* sp. nov. (Cricetidae) and *Peridyromys columbarii* sp. nov. (Gliridae). The third species, *Rhodanomys transiens*, places the age of the fauna in the Late Oligocene.

R. Daams, Museo Nacional de Ciencias Naturales, José Gutiérrez Abascal 2, E 28006 Madrid, Spain.

Introduction

In the framework of the project 'Geological Evolution of the Tertiary Basin of Loranca: Biostratigraphy, Sedimentology and Basin Analysis', financed by the CICYT, No. PB 85/0022, research of neighbouring basins was carried out as well. In this way the section of Sayatón was discovered by M. Díaz (Madrid). This section, which is situated on the eastern flank of the N-S directed anticline of Sayatón, covers more than 100 m of clays, silts, marls, thin limestones, gypsum, and sand-bodies. Several fossiliferous levels are present, from which some data were published by Alvarez et al. (1987), and Lacomba (in press). More detailed information on this section will be given in the near future.

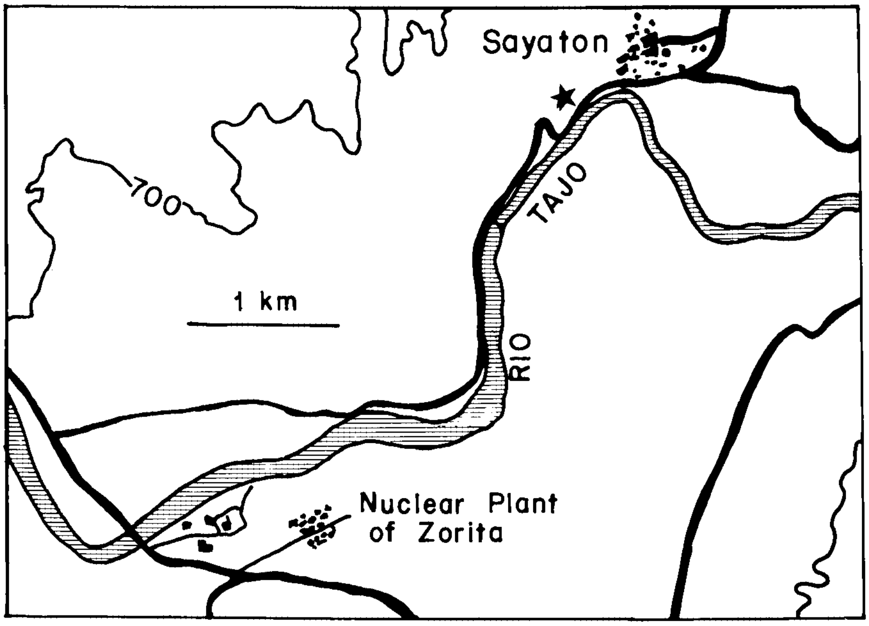


Fig. 1. Detail of the 1:50 000 maps of Pastrana (561) and Sacedón (562), province of Guadalajara. The locality of Sayatón 6 is indicated by an asterisk.

The locality of Sayatón 6 is a black silty clay bed with small gypsum crystals. This bed dips some 35-40° to the east, and it is situated below a several metres thick white gypsum bed below a pigeon loft, south of the cemetery of Sayatón, at the right border of the river Tague (Fig. 1). Some 2500 kg of sediments were screened, which yielded c. 250 dental remains.

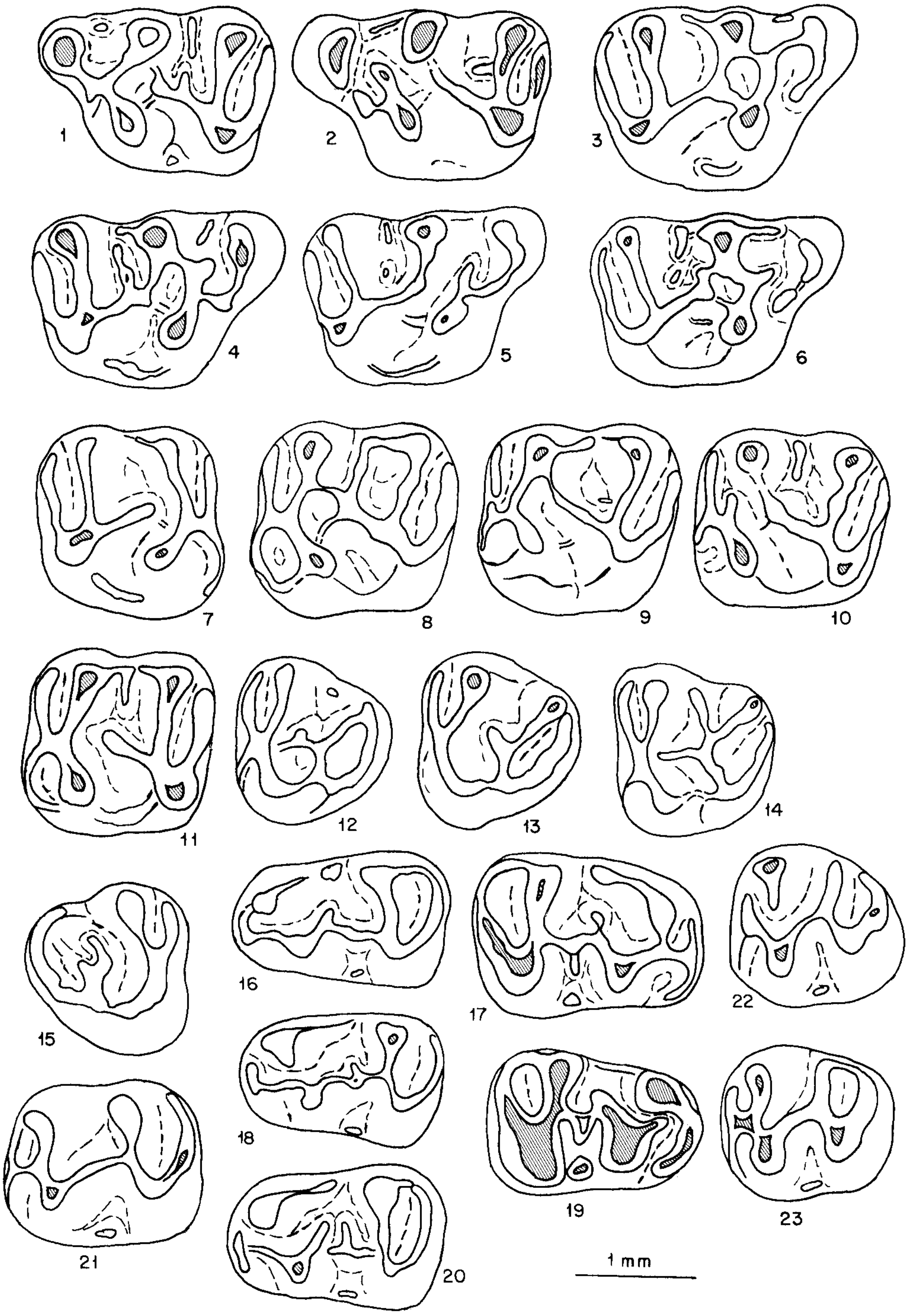
The teeth were measured using a Nikon monocular digital measuring microscope, and the measurements are given in 0.1 mm units. The nomenclature of parts of the cheek teeth for the Gliridae is after Daams (1981), for the Eomyidae after Alvarez (1987), and for the Cricetidae after Mein & Freudenthal (1971), and Freudenthal & Daams (1988).

The specimens are stored at the Museo Nacional de Ciencias Naturales, Madrid.

Plate 1

Adelomyarion alberti sp. nov.
Fig. 1. M^1 sin., SAY6 3.
Fig. 2. M^1 sin., SAY6 4.
Fig. 3. M^1 dext., SAY6 10.
Fig. 4. M^1 dext., SAY6 16.
Fig. 5. M^1 dext., SAY6 13.
Fig. 6. M^1 dext., SAY6 11, holotype.
Fig. 7. M^2 dext., SAY6 35.
Fig. 8. M^2 sin., SAY6 30.
Fig. 9. M^2 sin., SAY6 27.
Fig. 10. M^2 sin., SAY6 28.
Fig. 11. M^2 sin., SAY6 23.
Fig. 12. M^3 sin., SAY6 40.
Fig. 13. M^3 sin., SAY6 41.
Fig. 14. M^3 sin., SAY6 43.
Fig. 15. M^3 dext., SAY6 49.
Fig. 16. M$_1$ sin., SAY6 53.
Fig. 17. M$_1$ dext., SAY6 69.
Fig. 18. M$_1$ sin., SAY6 55.
Fig. 19. M$_1$ dext., SAY6 70.
Fig. 20. M$_1$ sin., SAY6 60.
Fig. 21. M$_2$ sin., SAY6 86.
Fig. 22. M$_3$ sin., SAY6 103.
Fig. 23. M$_3$ sin., SAY6 102.

Plate 1



Systematic descriptions

CRICETIDAE Rochebrune, 1883
Adelomyarion Hugueney, 1969

Adelomyarion alberti sp. nov.
Pl. 1, figs. 1-23; Pl. 2, figs. 1-3.

Holotype – M^1 dext., SAY6 11, Pl. 1, fig. 6.
Type-locality – Sayatón 6.
Age – Late Oligocene.
Derivatio nominis – After Dr Albert van der Meulen, Utrecht, The Netherlands.

Diagnosis – Large-sized *Adelomyarion* with a well-developed mesostyl-ridge in M^2, less developed in M^1. It has a well-developed free-ending posterior branch of the protoconid in M_1 and M_2, and a continuous ectolophid in M_2 and M_3.

Differential diagnosis – *Adelomyarion alberti* sp. nov. differs from *A. vireti* Hugueney, 1969 from its type-locality Coderet ('couche' 1) by its larger size, its well-developed mesostyl- ridges in M^1 and M^2, its free-ending posterior branch of the protoconid in M_1 and M_2, and the more continuous ectolophid in M_2 and M_3.

Material and measurements

	Length				Width			
	n	min.	mean	max.	n	min.	mean	max.
M^1	12	17.4	19.4	20.1	20	12.4	13.1	13.7
M^2	15	14.4	15.1	15.8	16	13.4	14.2	14.7
M^3	12	12.2	12.8	13.4	11	12.7	13.4	14.5
M_1	21	15.5	16.8	18.3	26	10.1	11.1	12.7
M_2	16	14.6	15.8	16.7	21	12.0	13.0	13.9
M_3	8	13.4	14.0	14.7	9	11.4	12.1	12.8

Description

M^1 – The position of the small, semi-circular, anterocone is variable. It may be situated towards the lingual side, resulting in a convex labial border, or it may be situated more labially, thus bringing about a concave labial border. Intermediate positions are also present. One out of 20 specimens has a split anterocone. Lingually the anterocone extends into a cingulum ridge, which is connected to the anterior base of the protocone or to the anterior branch of the protocone. Intermediate positions are present. The same cingulum ridge sends a short spur toward the lingual border in 13 out of 20 specimens. The anterosinus is bordered by a ridge-shaped crest. This crest may be isolated, or it may be the extension of an anterior cingulum ledge of the paracone. The centre of the anterocone shows a backward longitudinal ridge in 4 specimens, which in 3 of these specimens is connected to the extreme end of the anterior branch of the protocone. The anterior branch of the protocone is connected to the paracone in 9 out of 21 specimens. In the other 12 specimens it ends freely in the anterosinus. The posterior branch of the protocone is poorly developed; it is absent in 3 specimens, it is thin and low in 11 and well-developed in 7. The sinus is generally lingually bordered by a low cingulum ridge. The anterior branch of the hypocone points obliquely forward, and is connected to the paracone. A mesoloph, beginning at the mesocone, is present in 2 specimens only. In 1 of these 2 specimens it reaches the labial spur which descends from the paracone along the labial border. In the other specimen the mesoloph is short, and a long, transversely elongated, mesostyl extends deeply into the mesosinus. The mesosinus is labially bordered by a cingulum ridge. A mesostyl is present in 8 specimens. It may be a cusp or a transversely elongated ridge, whose lingual end joins the base of the metacone. The metalophule points obliquely forward, or it is more or less transverse. The posterosinus is wide and labially open. The sinus points obliquely forward and in 3 specimens small cusps are present in this valley.

M^2 – The labial anteroloph is well-developed, and it may or may not be connected to the base of the paracone. The lingual anteroloph is connected to the base of the protocone. The anterior protolophule points obliquely forward. In only 1 specimen the anterior protolophule is absent. The anterior branch of the hypocone joins the paracone in 8 specimens, and it ends freely in the mesosinus in 9. The posterior branch of the protocone is poorly developed; it is absent in 8 specimens, low and narrow in 8, and complete in 2. The paracone shows a postero-labial spur along the border of the tooth in 9 out of 16 specimens. A crest-like mesostyl is present in 12 specimens. In 1 specimen it is connected to the anterior branch of the hypocone. A short mesoloph is present in 2 specimens only. The sinus points obliquely forward, and is lingually bordered by a low cingulum ridge. The metalophule points obliquely forward, or it is transverse. The wide posterosinus is labially open, and in 2 specimens a small and low ridge is present on the posterior wall of the metacone.

M^3 – The labial anteroloph is connected to the base of the paracone or it ends freely. The lingual anteroloph is absent, or poorly developed. The protolophule points obliquely forward. The connection between protocone and hypocone (neo-entoloph) delimits a small sinus. In 2 specimens only, this connection is along the lingual border. The hypocone is connected to the the reduced metacone through the metalophule. In general, the dental pattern is rather variable (Pl. 1, figs. 12-15). The mesoloph and an interrupted axioloph may be present.

M_1 – The transversely elongated anteroconid is lower than the metaconid. In some cases the labially situated cusp constitutes merely a narrow ridge. Labially it may or may not reach the base of the protoconiid. Generally it joins the metaconid antero-lingually, but in 2 specimens it is separated from this cusp. The metaconid is situated anteriorly of the protoconid. The anterolophulid is interrupted in 9 specimens, and continuous in 14. The metalophulid is generally absent; it is present in 3 specimens only. The postero-lingual branch of the protoconid is connected to the ectolophid. This branch does not extend into the mesosinusid in 11 specimens, and in 16 it forms a short to half-long, free-ending ridge in the mesosinus. From the mesoconid a short mesolophid extends into the mesosinusid in 12 cases. An ectomesolophid is present in 10 specimens. The sinusid is labially bordered by a cusp or a ridge-like cusp. From the metaconid a crest descends along the lingual border, toward the base of the entoconid. In some cases this crest forms a mesostylid. The hypolophulid is transverse. The posterolophid ascends lingually to the top of the entoconid, thus enclosing the posterosinusid. In some specimens the posterolophid widens into a small cusp, which might be called a hypoconulid.

M_2 – The lingual anterolophid is separated from the base of the metaconid, or it encloses the anterosinusid. The labial anterolophid is well-developed and it joins the base of the protoconid. The metalophulid points obliquely forward or it is more or less transverse. Four out of 8 specimens lack the metalophulid. The posterior branch of the protoconid extends midway into the mesosinusid in 18 specimens, and it is absent in 4.

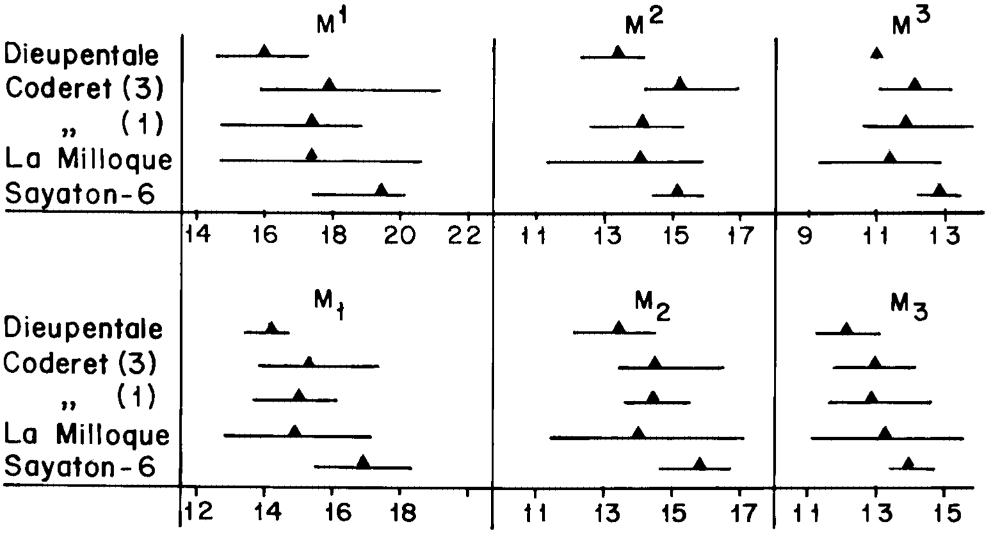


Fig. 2. Variation of length of the molars of *Adelomyarion vireti* from La Milloque, Coderet, and Dieupentale and *Adelomyarion alberti* from Sayatón 6. The given sequence does not necessarily represent the real chronological succession.

The mesolophid is absent. An ectostylid borders the sinus labially. A tiny ectomesolophid is present in 3 specimens. The mesoconid is absent, or hardly distinct. The hypolophulid is transverse. The posterolophid is connected to the entoconid, thus enclosing the posterosinusid.

M_3 – The lingual anterolophid is short, and separated from the base of the metaconid. In 1 out of 8 specimens this ridge is absent. The labial anterolophid descends to the base of the protoconid. The metalophulid points obliquely forward in 6 specimens, and in 2 it is absent. The obliquely backward pointing posterior branch of the protoconid (ectolophid) is connected to the hypolophulid. In 1 specimen this

---

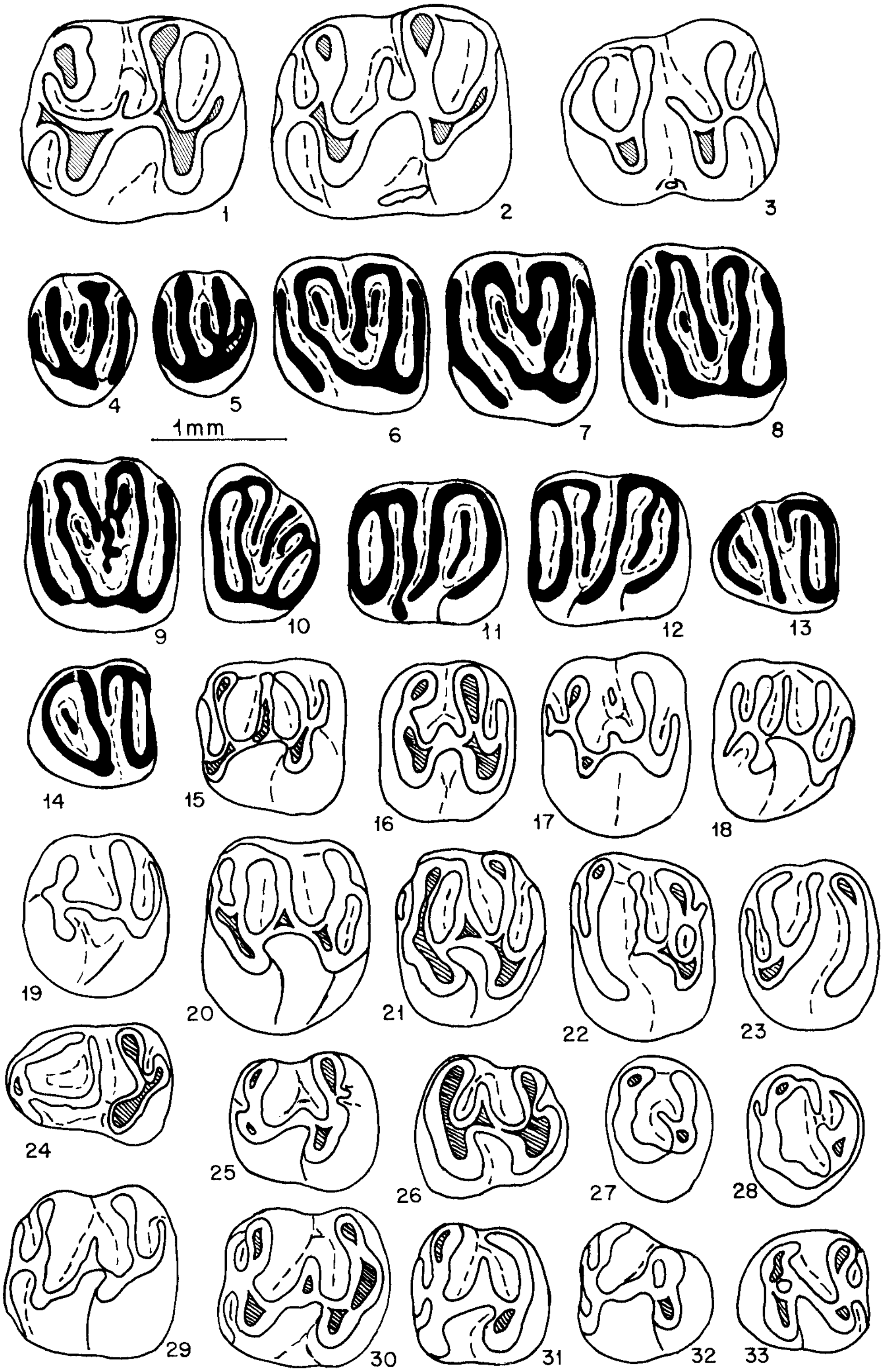
Plate 2

Adelomyarion alberti sp. nov.
Fig. 1. M_2 sin., SAY6 79.
Fig. 2. M_2 sin., SAY6 80.
Fig. 3. M_3 dext., SAY6 107.

Peridyromys columbarii sp. nov.
Fig. 4. P^4 sin., SAY6 179.
Fig. 5. P^4 dext., SAY6 180.
Fig. 6. M^1 sin., SAY6 181.
Fig. 7. M^1 sin., SAY6 182.
Fig. 8. M^2 sin., SAY6 187.
Fig. 9. M^2 sin., SAY6 188.
Fig. 10. M^3 sin., SAY6 191.
Fig. 11. M_1 sin., SAY6 193, holotype.
Fig. 12. M_2 sin., SAY6 198.
Fig. 13. M_3 dext., SAY6 203.
Fig. 14. M_3 dext., SAY6 204.

Rhodanomys transiens Hugueney, 1969
Fig. 15. D^4 dext., SAY6 114.
Fig. 16. P^4 sin., SAY6 115.
Fig. 17. P^4 sin., SAY6 116.
Fig. 18. P^4 sin., SAY6 117.
Fig. 19. P^4 sin., SAY6 118.
Fig. 20. M^1 sin., SAY6 134.
Fig. 21. M^1 sin., SAY6 130.
Fig. 22. M^2 sin., SAY6 133.
Fig. 23. M^2 dext., SAY6 144.
Fig. 24. D_4 sin., SAY6 152.
Fig. 25. P_4 sin., SAY6 155.
Fig. 26. P_4 dext., SAY6 157.
Fig. 27. M^3 sin., SAY6 149.
Fig. 28. M^3 sin., SAY6 150.
Fig. 29. $M_{1,2}$ sin., SAY6 164.
Fig. 30. $M_{1,2}$ sin., SAY6 159.
Fig. 31. M_3 sin., SAY6 161.
Fig. 32. M_3 sin., SAY6 173.
Fig. 33. M_3 dext., SAY6 175.

Plate 2


1
2
3
4
5
1mm
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33

posterior branch is interrupted just before reaching the hypolophulid. A distinct mesoconid is present in 2 specimens. An ectomesolophid is present in 2 out of 10 specimens. The posterolophid joins the reduced entoconid at its base, thus enclosing the posterosinusid. A small ectostylid is present in the sinusid in 6 specimens.

Discussion – *Adelomyarion* is a genus hitherto only known from the European Upper Oligocene. *A. vireti* has been described from its type-locality Coderet (Hugueney, 1969), Dieupentale (Baudelot & Olivier, 1978), La Milloque (Brunet, 1979), and it has been reported by Engesser & Mayo (1987) in Switzerland in the 'Assemblage Zones' of Fornant-6, Rickenbach and Küttigen. (Real assemblage zones should be defined and named according to the rules of stratigraphic nomenclature.) *A. alberti* sp. nov. from Sayatón 6 differs from *A. vireti* from its type-locality Coderet ('couche' 1) by its larger size, by the presence of mesostyl-ridges in M^1 and M^2, by its free-ending posterior branch of the protoconid in M_1 and M_2, and by the more continuous ectolophid of M_2 and M_3.

A. alberti differs from *A. vireti* from La Milloque by its less-developed anterior protolophule in M^1, by the absence of a cusp at the labial end of the labial anteroloph of M^2, by the better developed mesostyl-ridge in M^2, by the more frequent closing of the neo-entoloph in M^3, by the poorly developed metalophulid of M_1, and by the better developed mesolophid and ectomesolophid of M_1 and M_2.

A. alberti differs from *A. vireti* from Dieupentale by its much larger size (Fig. 1), by the presence of mesostyl-ridges in M^1 and M^2, by the absence of a cusp at the labial end of the labial anteroloph of M^2, by the presence of mesolophids and ectomesolophids in M_1 and M_2, and by the better developed lingual anterolophids of M_2 and M_3.

In general our species from Sayato'n 6 shows a more complex dental pattern than the French one. But since only the cricetids from La Milloque have been described the stratigraphic position of our fauna with respect to that of La Milloque is not known for the moment. We do not know if our species represents the ancestor of *A. vireti*, or whether it is a contemporaneous species, endemic in Spain.

EOMYIDAE Depéret & Douxami, 1902
Rhodanomys Depéret & Douxami, 1902

Rhodanomys transiens Hugueney, 1969
Pl. 2, figs. 15-33.

Material and measurements

	Length n	min.	mean	max.	Width n	min.	mean	max.
D^4	3	9.6	9.8	9.9	3	9.5	9.9	10.3
P^4	12	9.6	10.2	10.9	12	10.4	11.2	12.4
M^1	8	10.2	11.1	11.6	7	11.9	13.1	13.9
M^2	11	8.9	9.7	10.4	9	11.0	12.1	13.3
M^3	3	7.5	7.7	8.1	3	9.1	9.5	9.8
D_4	2	11.3	11.5	11.7	2	7.8	7.9	8.0
P_4	5	9.9	10.5	10.9	5	8.8	9.1	9.5
$M_{1,2}$	15	10.8	11.6	12.5	17	10.3	11.3	12.2
M_3	6	9.2	9.5	10.1	5	8.2	9.2	9.9

Description — Rather bunodont teeth.

D^4 — The anteroloph is short, and joins the protoloph midway between the paracone and protocone. Labially the anterosinus is open. The longitudinal ridge is complete in 2 specimens, and it is interrupted behind the protocone in 1. The long mesoloph reaches the labial border. In 1 specimen a posterior spur of the paracone joins the labial end of the mesoloph, thus closing the anterior mesosinus. The sinus points slightly forward. The posterior mesosinus is open in 2 specimens and closed in the other one. The posterosinus is labially open.

P^4 — A low labial anteroloph is present in 3 out of 11 specimens. In 2 specimens the anteroloph is indicated by a cusp midway between para- and protocone. In 2 out of the 3 specimens with labial anteroloph, a short lingual anteroloph is also present. The longitudinal ridge is complete and high in all specimens. The mesoloph is absent in 3, very short in 8 and long, reaching the labial border in 1 specimen. Two specimens have an elongated mesostyl near the labial border. The metaloph points forward in 4, it is transverse in 5, and it points backward in 1 specimen. The posteroloph originates from the hypocone. It is short in 2 specimens, of medium length in 2, and long in 6. The posterosinus is labially open.

$M^{1,2}$ — A modest anteroloph originating midway between paracone and protocone, is present in all 10 M^1 and in 7 out of 11 M^2. This ridge is thinner and lower in M^2 than in M^1, and in both elements the anterosinus is labially either open or closed. The longitudinal ridge is absent behind the protocone in 2 out of 11 M^1 and in 4 out of 14 M^2. In the other ones this ridge is well developed. The mesoloph is long, and it reaches the paracone at the labial border in all M^1 and in 12 out of 14 M^2. One M^2 has a short mesoloph, 1 specimen lacks this ridge, and in 2 specimens the mesoloph is slightly interrupted. The posterior mesosinus is labially open. The sinus points sharply forward. The posteroloph originates from the hypocone and reaches, or nearly reaches the lingual base of the metacone in all M^1 and M^2. The posterosinus is labially either open or closed.

M^3 — A small anteroloph is present near the labial border. Protocone and hypocone meet, thus closing the sinus. The mesoloph reaches the labial border in 2 specimens, and it is short in 1. The posterior mesosinus is labially open. The posteroloph is absent.

D_4 — Lingual and labial ridges descend from the anteroconid, the lingual one being the longer and wider of the two. The lingual one reaches the long mesolophid at the lingual border. The labial one is short and does not close the wide sinusid. There is not the slightest trace of protoconid or metaconid. The straight longitudinal ridge is well developed in its anterior part. In 1 specimen it continues to the hypoconid, in the other one it is interrupted just before reaching this cusp. The posterolophid originates from halfway the hypolophid to reach the base of the entoconid.

P_4 — Remains of an anterolophid are present in 4 out of 6 specimens, originating from the lingual side of the protoconid. The oblique longitudinal ridge is complete. The mesolophid is absent in 2 specimens, it is of medium length in 1, and long, reaching the lingual border in 3. Remains of a posterolophid are present in 1 specimen.

$M_{1,2}$ — The labial and lingual anterolophid are well-developed ridges; the labial one reaches the labial border, the lingual one does not reach beyond the anterior base of the metaconid. The anterosinusid (the valley between metaconid and anterolophid) is open, the lingual one may be either open or closed. The metalophid points obliquely forward. The longitudinal ridge is complete. The mesolophid is of medium length in all specimens. The sinusid points slightly to sharply backward. A small posterolophid is present in 3 out of 16 specimens. In the other ones the posterolophid is absent, but a swelling of the hypolophid marks a cusp that might be called hypoconulid.

M_3 – A well-developed lingual and labial anterolophid are present in 4 specimens. One specimen shows small remnants of these ridges and 2 other specimens are too worn to appreciate this character. The mesolophid is absent in 1 specimen; in 4 other cases this ridge reaches the reduced entoconid, and in 1 specimen the medium-sized mesolophid is separated from the entoconid. The sinusid points sharply backward.

Discussion – *Rhodanomys transiens* from Sayato'n 6 is approximately of the same size as the same species from Bergasa (Ebro Basin, La Rioja). The following differences are observed:
The anteroloph and posteroloph of P^4, M^1 and M^2 are better developed in Sayatón 6. The mesolophids of M_1, M_2 and M_3 are longer in Sayatón 6.

According to Alvarez (1987) the *Rhodanomys transiens-Ritteneria manca* lineage is characterized by a trend towards a simplification of the dental pattern. *R. transiens* from Sayatón 6 therefore represents a more conservative dental pattern than the same species from Bergasa, but not to such an extent that it warrants a new species name.

R. transiens from Sayatón 6 is smaller than *R. hugueneyi* Engesser, 1987 from Küttigen, and our species has a slightly more simple dental pattern.

GLIRIDAE Thomas, 1897
MYOMIMINAE Daams, 1981
Peridyromys Stehlin & Schaub, 1951

Peridyromys columbarii sp. nov.
Pl. 2, figs. 4-14.

Holotype – M_1 sin., SAY6 193, Pl. 2, fig. 11.
Type-locality – Sayatón 6.
Age – Late Oligocene.
Derivatio nominis – Genitive of columbarium, Latin for pigeon-house, as the fossiliferous level is situated below a pigeon-house outside the village of Sayatón.

Diagnosis – Relatively low-crowned *Peridyromys* with long centrolophids in $M_{1,2}$, 1 extra ridge in the lower molars, and 1 or 2 accessory ridges in the upper ones.

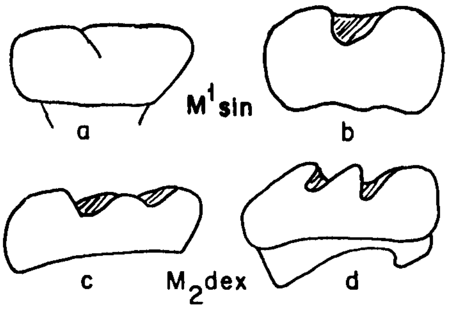


Fig. 3. Labial and lingual views of unworn M^1 and M_2.
a: M^1 of *Peridyromys columbarii*, lingual view.
b: M^1 of *Peridyromys murinus*, lingual view.
c: M_2 of *Peridyromys columbarii*, labial view.
d: M_2 of *Peridyromys murinus*, labial view.

Differential diagnosis – *P. columbarii* sp. nov. differs from *P. murinus* (Pomel, 1853) from the Upper Oligocene and Lower Miocene of Spain and France by its lower ridges (Fig. 3), by its more complicated dental pattern, and by the longer centrolophids of $M_{1,2}$.

P. columbarii sp. nov. differs from *P. aquatilis* (de Bruijn & Moltzer, 1974) from the Lower Miocene of Rubielos de Mora by its slightly larger size, by the presence of only the posterior extra ridge in the lower molars, and by the more complicated dental pattern of $M^{1,2}$.

P. columbarii sp. nov. differs from *P. prosper* Thaler, 1966 from the Lower Miocene of Bouzigues by its smaller size, its less complex lower molars and its longer centrolophid of $M_{1,2}$.

P. columbarii sp. nov. differs from *P. jaegeri* Aguilar, 1974 from the Lower Miocene of Les Cévennes by its less complex dental pattern.

Material and measurements

	Length				Width			
	n	min.	mean	max.	n	min.	mean	max.
P^4	5	6.9	7.3	7.8	4	8.8	9.0	9.4
M^1	6	9.8	10.3	10.8	5	10.8	11.1	11.5
M^2	4	10.2	10.6	11.0	3	11.8	12.5	13.0
M^3	2	7.9	8.1	8.2	2	10.5	10.6	10.6
M_1	4	10.5	10.8	11.6	3	9.4	10.1	10.8
M_2	5	10.4	10.8	11.1	5	9.9	10.2	10.7
M_3	2	8.3	8.5	8.6	2	7.7	8.1	8.5

Description

P^4 – The anteroloph is isolated, and varies from short to long. Four specimens have 2 centrolophs; in these specimens the posterior one is longer than the anterior one. One specimen has only 1 centroloph. In this specimen the lingual end of this ridge curves forward to join the protoloph. The posterior centroloph is separated from the metacone by a shallow and narrow furrow, which disappears with progressive wear. Labially the posteroloph ends free, lingually it joins the protocone.

$M^{1,2}$ – The occlusal surface is concave. The anteroloph is a well-developed, wide and isolated ridge. In 1 M^2 the lingual end of the anteroloph joins the protoloph by means of a narrow ridge, thus forming an endoloph. Two centrolophs are present, which are connected to para- and metacone respectively. In 7 specimens these ridges fuse in the central valley. In the other 2 specimens the anterior centroloph is longer than the posterior one. Four specimens have 1 extra ridge only, which is situated between the protoloph and the anterior centroloph. Five specimens have 2 extra ridges, of which the first one is situated as above, and the second one lies between the posterior centroloph and the metaloph. The posteroloph joins the protocone labially, lingually it is isolated from the metacone.

M^3 – There is an endoloph. Labially the anteroloph joins the paracone. Two centrolophs are present, of which the posterior one is the longer. A posterior extra ridge is present. The posteroloph is separated from the metacone.

M_1 – The ridges are more or less parallel. The anterolophid is connected to the protoconid, and the metalophid to the metaconid. The centrolophid is long, and it reaches the labial tooth border in 2 out of 4 specimens. A long accessory ridge is present in the posterior valley. The molar has 2 roots.

M_2 – The dental pattern is basically the same as that of M_1, although in none of the 5 specimens the centrolophid reaches the labial tooth border. In 1 specimen the long posterior extra ridge joins the entoconid.

M_3 – The anterolophid joins the protoconid and the metalophid the metaconid. The centrolophid is short or of medium length. The mesolophid and posterolophid are separated at the entoconid by a furrow. In 1 specimen the mesoloph and posterolophid join at the labial border. An extra ridge is present in the posterior valley.

Discussion – We are not sure whether *P. columbarii* is the direct ancestor of *P. murinus*. First of all, the fossil record of the Late Oligocene faunas is still inadequate, and the generally poor faunas from Western Europe are difficult to correlate because of the lack of characteristic common species.

In the Upper Oligocene of St. Victor-la-Coste, Gard, France (Hugueney, 1968) *P. murinus* is described. The species from this locality has a dental pattern intermediate in complexity between *P. columbarii* and *P. murinus* from the Lower Miocene of France and Spain. We do, however, not know the relative stratigraphic position of St. Victor with respect to Sayatón 6, because of the absence of characteristic common species (Rémy & Thaler, 1967). If *P. columbarii* is the ancestor of *P. murinus*, this would mean that there is a trend during the Late Oligocene toward higher ridges, toward a simpler dental pattern, and toward a slight size decrease.

On the other hand *P. columbarii* from Sayatón 6 has some features in common with *Ebromys bergasensis* Lacomba (in press) from the uppermost Oligocene of Bergasa (Ebro Basin, La Rioja). The long centrolophid, frequently reaching the labial tooth border in the $M_{1,2}$ of *Ebromys*, is seen in some M_1 of *P. columbarii* as well. The upper molars of both species have more or less the same complex dental pattern, but the lower molars of *Ebromys bergasensis* are generally more complicated by the presence of an extra ridge in the anterior valley. Moreover, the two species are approximately of the same size.

Conclusions

The extremely poor fauna of Sayatón 6 contains only three rodent species of which two are new. The relative frequencies are:
63 % *Adelomyarion alberti* sp. nov.
15 % *Peridyromys columbarii* sp. nov.
22 % *Rhodanomys transiens* Hugueney, 1969.

The evolutionary stage of *Rhodanomys transiens* situatesthis fauna stratigraphically somewhat below that of Bergasa (Zone W, Alvarez et al., 1987) and younger than that of Vivel del Río. The levels of Sayatón 0 and Sayatón 1 of which part of the faunal composition is given in Alvarez et al. (1987) are situated below that of Sayatón 6 in the same section.

On the basis of the evolutionary stage of *Rh. transiens* the fauna of Sayatón 6 is also supposed to be older than those of Coderet (Hugueney, 1969) and Dieupentale (Baudelot & Olivier, 1978). The fauna of La Milloque is considered to be older than that of Coderet by Brunet (1979), but as the Eomyidae from La Milloque have not yet been described, we do not know the relative position of Sayatón 6 with respect to this locality.

As for the palaeoeological conditions it is still premature to draw any conclusions. The environmental preference of the most abundant taxon *Adelomyarion* is not known. *Rhodanomys* is supposed to be a representative of humid biotopes (Daams & van der Meulen, 1984) and the biotope of *Peridyromys columbarii* is unknown. *P. columbarii* constitutes an intermediate form between the Simple Asymmetrical Molar Group (open country) and the Complicated Asymmetrical Molar Group (probably forests) (Daams & van der Meulen, 1984).

It is striking that in Spain various Late Oligocene faunas are so impoverished and lack Eomyidae. This is also true for the fauna of Sayatón 1 and the faunas of the *Rhodanomys transiens* Zone in the eastern Ebro Basin (Agustí et al., 1987). Various of these fauna types are also present in the Upper Oligocene of the Aragonese Pyrenees, but these are still under study.

References

Aguilar, J.-P., 1974. Les rongeurs du Miocène inférieur en Bas-Languedoc et les corrélations entre échelles stratigraphiques marine et continentale. – Géobios, 7, 4: 345-398.

Agustí, J., P. Anadón, S. Arbiol, L. Cabrera, F. Colombo & A. Sáez, 1987. Biostratigraphical characteristics of the Oligocene sequences of North-Eastern Spain (Ebro and Campins Basins). – Münchner Geowiss. Abh., A, 10: 35-42.

Alvarez, M.A., 1987. Estudio sistemático y bioestratigráfico de los Eomyidae (Rodentia) del Oligoceno superior y Mioceno inferior español. – Scripta Geol., 86: 1-207, 33 pls.

Alvarez, M.A., R.Daams, J.I. Lacomba, N. López Martínez & M.A. Sacristán, 1987. Succession of micromammal faunas in the Oligocene of Spain. – Münchner Geowiss. Abh., A, 10: 43-48.

Baudelot, S., & Olivier, 1978. Les rongeurs (Mammalia, Rodentia) de l'Oligocéne terminal de Dieupentale (Sud-Ouest de la France: Tarn-et-Garonne). – Géobios, 11, 1: 5-19.

Bruijn, H. de, & J.G. Moltzer, 1974. The rodents from Rubielos de Mora; the first evidence of the existence of different biotopes in the Early Miocene of eastern Spain. – Proc. Kon. Ned. Akad. Wetensch., B, 77, 2: 129-145, 3 pls.

Brunet, M., 1979. Les Cricetidae (Rodentia, Mammalia) de La Milloque (Bassin d'Aquitaine), horizon-repère de l'Oligocéne supérieur. – Géobios, 12, 5: 653-673.

Daams, R., 1981. The dental pattern of the dormice *Dryomys*, *Myomimus*, *Microdyromys* and *Peridyromys*. – Utrecht Micropal. Bull., Spec. Publ. 3: 1-115, 5 pls.

Daams, R., & A.J. van der Meulen, 1984. Paleoenvironmental and paleoclimatic interpretation of micromammal faunal successions in the Upper Oligocene and Miocene of north central Spain. – Paléobiol. Continent., 14, 2 (R.C.M.N.S. Interim Coll. Mediterranean Neogene continental paleoenvironments and paleoclimatic evolution, Montpellier, 1983): 241-257.

Engesser, B., & N.A. Mayo, 1987. A biozonation of the Lower Freshwater Molasse (Oligocene and Agenian) of Switzerland and Savoy on the basis of fossil mammals. – Münchner Geowiss. Abh., A, 10: 67-84.

Freudenthal, M., & R. Daams, 1988. Cricetidae (Rodentia) from the type-Aragonian; the genera *Democricetodon, Fahlbuschia, Pseudofahlbuschia* nov. gen., and *Renzimys*. – Scripta Geol., Spec. Issue 1: 133-252, 16 pls.

Hugueney. M., 1968. Les Gliridés (Rodentia) de l'Oligocène supérieur de St. Victor-la-Coste (Gard). – Palaeovertebrata, 2, 1: 1-23, 3 pls.

Hugueney, M., 1969. Les rongeurs (Mammalia) de l'Oligocène supérieur de Coderet-Bransat (Allier). – Doc. Lab. Géol. Fac. Sci. Lyon, 34: 1-227, 5 pls.

Lacomba, J.I., (in press). Estudio de las faunas de micromamíferos del Oligoceno superior y Mioceno inferior en las Cuencas de Loranca y Ebro Riojano. Aspectos paleoecológicos. – Pal. i Evolució.

Mein, P., & M. Freudenthal, 1971. Les Cricetidae (Mammalia, Rodentia) du Néogène Moyen de Vieux-Collonges. Partie 1: Le genre *Cricetodon* Lartet, 1851. – Scripta Geol., 5: 1-51, 6 pls.

Rémy, J.A., & L. Thaler, 1967. Notes sur les phosphorites de St. Victor-la-Coste (Gard) et leur faune de Vertébrés Oligocènes. – C. R. Soc. Géol. France, 1967, 4: 161-162.