

Miocene Gliridae (Mammalia: Rodentia) from Grytsiv (Ukraine)

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Abstract. Remains of Gliridae from the locality Grytsiv in the Ukraine are described. *Glis vallesiensis* AGUSTI, 1981, *Muscardinus topachevskii* sp. nov., *Myoglis ucrainicus* sp. nov., *Paraglrulus* cf. *werenfelsi* ENGESSER, 1972 and *Miodyromys grycivensis* sp. nov. were identified in the material studied. Their age can be determined as Late Miocene, equivalent to Middle Sarmatian (Early Vallesian, MN 9). This paper is a first description of a Miocene fauna of dormice from Eastern Europe.

Key words: fossil mammals, Gliridae, Miocene, Ukraine.

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INTRODUCTION

The fossil vertebrate locality Grytsiv is situated in the Khmelnytsky Region of the Ukraine. A preliminary description of the locality and its fauna, mainly that of large mammals, was made in a paper by E. KOROTKEVICH et al. (1985). Karst hollows of the fossil reef of the Middle Sarmatian Sea were filled with clays containing mollusc shells and vertebrate bones. An analysis of the geological structure of the locality, and a study of different groups of fossils and palaeomagnetic data permitted a rather precise determination of the age on the scale of marine stratigraphy of the Eastern Paratethys. The fauna of Grytsiv corresponds to the lower part of the Middle Sarmatian, to the Novomoskovski horizon of the Bessarabian substage. The fauna of mammals is referred to the Lower Vallesian or zone MN 9 of the West-European continental scale (TOPACHEVSKY et al. 1996). The mammalian fauna of Grytsiv is the oldest known so far not only from the Ukraine, but from entire Eastern Europe. Remains of Gliridae in the Mio-Pliocene localities of this region are rare, scarce and so far unstudied.

At Grytsiv dormice are a subdominant group of rodents. They are represented mainly by isolated teeth, seldom by fragmentary upper and lower jaws. About one hundred specimens suitable for taxonomic identification were used in the present study. They are all stored in the Paleontological Museum, a division of the Central Museum of Natural History of the National Academy of Sciences of the Ukraine in Kiev, as collection N 22. All the illustrations and measurements were made by V. NESIN. The nomenclature of tooth elements follows that established by H. DE BRUIJN (1966).

SYSTEMATIC PART

Family Gliridae THOMAS, 1897

Subfamily Glirinae THOMAS, 1897

Genus *Glis* BRISSON, 1762*Glis vallesiensis* AGUSTI, 1981

Fig. 1

M a t e r i a l. Isolated molars: 1 left M^1 , 1 right M_1 , 1 left M_2 ; 1 left mandible with M_3 , 1 isolated left M_3 (No 22, 2178-2182).

D e s c r i p t i o n. Occlusal surface of all molars concave, particularly that of upper teeth.

M^1 (No 2178; Fig. 1:A) has three roots, one large, situated lingually, two smaller labially. Occlusal surface with six main ridges varying in development. The centroloph and the metaloph are worse developed and about the same size as the anterior centroloph and the metaloph. Labially the metaloph and the posterior centroloph join together the posteroloph. Other ridges remain isolated. The lingual parts of the anteroloph and the protoloph are distinctly bent backwards. The remaining three ridges are parallel to one another and perpendicular to the longitudinal axis of the crown. Only the ends of the strongly-built posterior centroloph are directed backwards. On the contrary, both ends of the posteroloph turn forward. The anteroloph, situated on the border of the occlusal surface, extends along its entire anterior side and half of its lingual side. Between it and

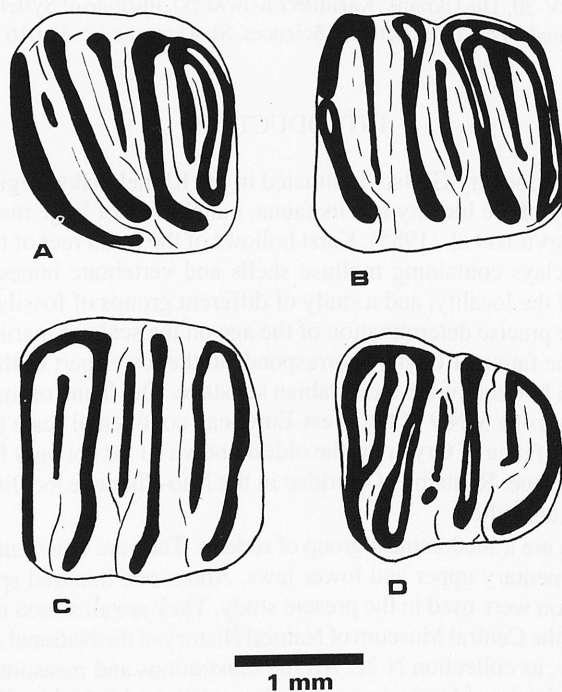


Fig. 1. *Glis vallesiensis*, Grytsiv. A – left M^1 (No 2178), B – right M_1 (No 2179), C – left M_2 (No 2180), D – left M_3 (No 2182).

the protoloph there is an accessory ridge in the form of a low elevation of the enamel, situated labially to the longitudinal axis of the crown.

P₄ was one-rooted, as evidenced by its unique alveole on the preserved fragment of the mandible.

M₁ (No 2179; Fig. 1:B) has two roots, its occlusal surface is slightly narrowed anteriorly. The crown is elongated. Besides six main ridges there is one accessory ridge situated between the centrolophid and the metallophid. The anterolophid borders the anterior part of the crown and merges with the centrolophid on the lingual side. The worse-developed protolophid ends at the top of this narrow bend. In the posterior part of the occlusal surface is the free mesolophid and the posterolophid which contacts the posterior accessory ridge on the lingual side. The labial ends of all ridges remain free.

M₂ (No. 2180; Fig. 1:C) has two roots. Its occlusal surface is nearly square, with six main ridges. The unique accessory ridge is situated centrally, between the centrolophid and the mesolophid. The development of the ridges, their shape and connections are similar to those in M₁, except for the metallophid which in M₂ is worse developed and not connected to other ridges.

M₃ (No 2182; Fig. 1:D) has two roots, the posterior root in one specimen is divided near its end. The dimensions of this tooth are much smaller than in remaining molars. The posterior part of the crown is distinctly narrowed and its posterior border rounded. The pattern of its grinding surface in general resembles that of M₁₋₂ except for the metallophid which in M₃ merges with the anterolophid. This merging is visible on both the lingual and labial sides of the tooth.

D i m e n s i o n s. See table I.

Table I

Dimensions of teeth in *Glis vallesiensis* from Grytsiv (in mm)

| Tooth | No | Length | Width |
|----------------|------|--------|-------|
| M ¹ | 2178 | 1.75 | 1.87 |
| M ₁ | 2179 | 1.95 | 1.81 |
| M ₂ | 2180 | 1.90 | 1.92 |
| M ₃ | 2181 | 1.70 | 1.80 |
| M ₃ | 2182 | 1.75 | 1.80 |

R e m a r k s. The teeth from the Ukraine described above do not differ essentially from those belonging to *Glis vallesiensis* AGUSTI, 1981 described from the Vallesian of Spain (AGUSTI 1981). On the other hand, they differ from those in all other species of *Glis* both in morphology and in size. The differences between the material from Grytsiv and that from Spain do not go beyond the intraspecific variability of particular species of *Glis*, as shown by DAOUD (1993) on the basis of large samples of this genus.

Genus *Muscardinus* KAUP, 1829

Muscardinus topachevskii sp. nov.

Fig. 2

H o l o t y p e. Right M₂, No 22, 2170, Fig. 2:I. Dimensions: L = 1.34, W = 1.29.

D e r i v a t i o n o m i n i s. In honour of the eminent Ukrainian paleontologist, professor W. A. TOPACHEVSKY.

R e m a i n i n g m a t e r i a l. 1 fragment of left maxilla with P⁴ - P², 1 fragment of right maxilla with M¹ - M², isolated upper molars: 1 left M¹, 1 right M², 1 right M³; 1 fragment

of left mandible with M_1 , isolated lower molars: 7 M_1 (3 left, 4 right), 1 left M_2 . (No 22, 2154 - 2167).

Type locality. Grytsiv, the Ukraine, Middle Sarmatian, MN 9.

Diagnosis. Teeth small. P^4 with four transversal ridges. M^1 elongated, narrowed in its anterior part, and narrower than M^2 , with five transversal ridges. M^2 - M^3 with six ridges. M_1 has five, M_2 six transversal ridges. Both these teeth are two-rooted.

Description. Occlusal surface of all teeth flat. Unique P^4 preserved (No 2164) with one root, on the maxilla with two first molars the alveole of P^4 also indicates the presence of one root. The tooth is very small, with a rounded crown. Four transversal ridges present on the occlusal surface do not merge on the labial side of the tooth. They probably ended free also on the lingual border, but this part of the tooth is damaged.

M^1 (No 2155, 2156; Fig. 2:A-B) has three roots: two small on the labial side, one larger, flattened laterally on the lingual side. The crown is distinctly elongated and narrowed in its anterior part. A distinct incurvation is present in the middle of the labial border of the crown. On the occlusal surface there are five well developed ridges directed slightly obliquely towards the posterolingual corner of the crown. The anteroloph is not connected with the remaining ridges and is separated from them by a deep valley. The protoloph, anterior centroloph, metaloph and posteroloph end independently on the labial border, while on the lingual border they are connected with the longitudinal ridge (endoloph, according to ENGESSER 1972). The posteroloph is very narrow in

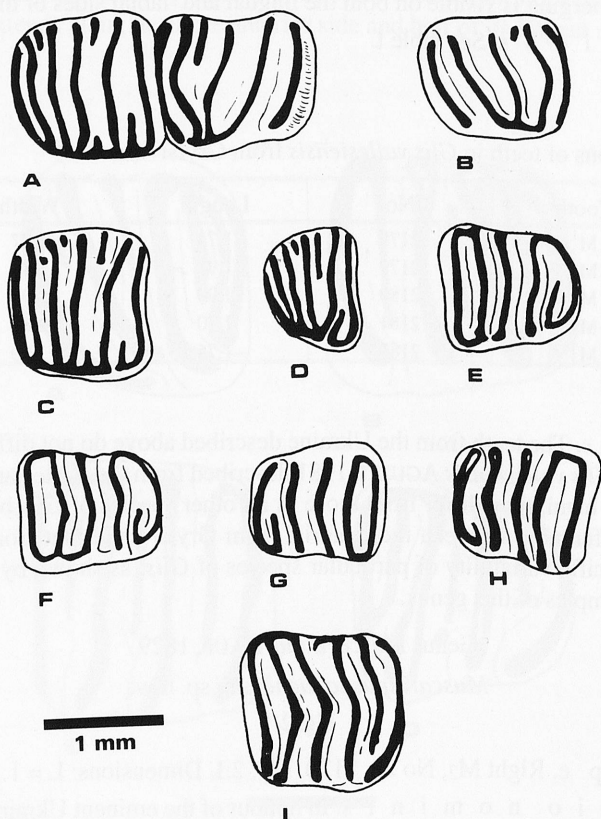


Fig. 2. *Muscardinus topachevskii* sp. nov., Grytsiv. A - right M^1 - M^2 (No 2155), B - left M^1 (No 2156), C - right M^2 (No 2157), D - right M^3 (No 2158), E - right M_1 (No 2159), F - right M_1 (No 2160), G - left M_1 (No 2161), H - left M_1 (No 2162), I - right M_2 (No 2170, holotype).

comparison with the remaining ridges. The metaloph is convex backwards. The posterior centroloph is poorly developed, occupying only less than half of the width of the occlusal surface. In one case it is represented only by a cusp on the border of the crown. Strongly reduced anterior accessory ridge is present only in one specimen, where it has the form of an insignificant cusp on the labial border of the tooth.

M² (No 2155, 2157; Fig. 2:A, C) has three roots. Its occlusal surface is nearly square in outline and, differently from M¹, is slightly narrowed in its posterior part. It has six distinct transversal ridges, separated by valleys, which are wider in the anterior part of the tooth. The posterior valley is the narrowest, not much broader than the ridges. On the labial side the ridges are isolated, on the lingual connected by the continuous, long ridge which extends from the anteroloph to the posteroloph. The lingual side of the anteroloph curves backwards and labially, thus forming accessory ridge. In the place where this accessory ridge joins the marginal longitudinal ridge an inconspicuous interruption sometimes occurs. A slightly developed accessory ridge exists also on the labial side of the valley, separating the second (protoloph) and the third (anterior centroloph) of the main ridges. This valley widens where the labial border of the protoloph turns forwards. All the ridges, with the exception of the case mentioned above, are nearly parallel. In two of the three specimens there is a small cusp, lingual to this valley, on the longitudinal ridge. Small accessory ridges are also present on the labial side between the metaloph and the posterior centroloph, and sometimes also between the centrolophs.

M³ (No 2158; Fig. 2:D) has three roots about the same size, two of them situated in the anterior, one in the posterior part of the tooth. This tooth is strongly reduced, distinctly smaller than M¹⁻². Its occlusal surface is triangular, with six transversal ridges, not connected labially. The anteroloph bends backwards on the lingual side and continues as the lateral longitudinal ridge connected with the posteroloph. Other main ridges reach the lingual longitudinal ridge. One accessory ridge is situated behind the anteroloph on the lingual border of the crown. Two other accessory ridges are developed on the labial side: the larger, reaching the middle of the crown, is situated behind the protoloph, the other, in the form of an inconspicuous cusp, before the posterior centroloph. Five main ridges of this tooth except the anteroloph, approach one another on the lingual side of the tooth, and diverge fanwise on its labial side. The protoloph and the anterior centroloph join at an acute angle before reaching the lingual latitudinal ridge.

P₄, judging from the alveole preserved in the mandible with M₁, was small and one-rooted.

M₁ (No 2159; Fig. 2:E) has two roots; in one specimen the posterior root is bifurcated near its end. Five main transversal ridges on the occlusal surface of the crown are bend forwards. The lingual end of the anterolophid is directed backwards and merges with the metalophid which is unobscured and reaches only the middle of the crown. In the majority of specimens the centrolophid is united with the anterolophid on the labial side of the crown but not lingually. In two specimens, however, the metalophid ends free on both sides (Fig. 2:G, H). On the other hand in heavily worn teeth the centrolophid merges with the anterolophid on both sides. The anterior part of the occlusal surface is separated from the posterior one by a deep valley. Posterior to the mesolophid there is another deep valley, slightly shallower on lingual side. In two specimens a crest developed in this place connects the mesolophid and the posterior accessory ridge (Fig. 2: F). The latter joins the posterolophid on both sides of the crown forming a closed oval valley on the talonid of the tooth, limited from all sides by ridges. The posterolophid is usually situated on the border of the crown, but it may be shifted forwards, especially on the lingual side of the crown, provoking here the formation of a step of enamel. No other accessory ridges are present. The middle part of valleys on some teeth may present a weakly developed enamel sculpture.

M₂ (No 2170; Fig. 2:I) has two roots, on the anterior one there is sometimes a longitudinal groove. The occlusal surface of the crown is nearly square, only slightly narrowed in its posterior

part. Six transversal ridges bent forwards are present. Only the anterior ridge is straight and the posterior has only a slight bend. The metalophid is well developed, and extends right across the crown. It merges with the centrolophid on the lingual side. On heavily worn teeth it can also join the anterolophid. The posterolophid is connected with the anterior accessory ridge on both sides of the crown, forming a closed valley subtriangular in outline. On its lingual side the centrolophid has an indistinct bending directed forwards and labialwards. The remaining ridges are separated by broad valleys, which are deeper in the posterior part of the crown than in the anterior. Indistinct sculpture exists at the bottom of the valleys only in the holotype.

D i m e n s i o n s. See table II.

Table II

Dimensions of teeth in *Muscardinus topachevskii* sp. nov. (in mm)

| Tooth | n | Length | | | Width | | |
|----------------|---|--------|------|------|-------|------|------|
| | | m | min | max | m | min | max |
| P ⁴ | 1 | 0.68 | — | — | 0.72 | — | — |
| M ¹ | 3 | 1.29 | 1.22 | 1.35 | 1.09 | 1.05 | 1.14 |
| M ² | 3 | 1.24 | 1.19 | 1.28 | 1.25 | 1.21 | 1.28 |
| M ³ | 1 | 0.80 | — | — | 1.05 | — | — |
| M ₁ | 8 | 1.20 | 1.14 | 1.25 | 1.05 | 0.98 | 1.13 |
| M ₂ | 2 | 1.31 | 1.27 | 1.34 | 1.21 | 1.13 | 1.29 |

R e m a r k s. About ten species have been described in the genus *Muscardinus*. They can be divided into two groups according to their dimensions: small and large. The population from Grytsiv belongs evidently to the group of smaller species and represents one of the smallest fossil species of *Muscardinus*. In morphology and dimensions the specimens from Grytsiv are nearest *M. hispanicus* DE BRUIJN, 1966, differing slightly more from *M. vireti* HUGUENEY & MEIN, 1965 and *M. heinzi* AGUILAR, 1981.

Muscardinus topachevskii sp. nov., besides smaller dimensions, differs from the above mentioned species in the number of ridges and roots on premolars and molars. From *M. vireti* it differs in a smaller number of roots on M¹ - M³ (three instead of four), and in a smaller number of transversal ridges on the occlusal surface of the crown: on M¹ five instead of six, on M² - M³ six instead of eight. From the larger species, *M. heinzi*, *Muscardinus* from Grytsiv differs also in a smaller number of roots of upper molars (three instead of four) and on lower molars (two instead of three). From *M. hispanicus*, the species closest to it in morphology and dimensions, the Ukrainian form differs in a higher number of ridges on P⁴ and lower on M₁ (five instead of six). Besides, *M. hispanicus* has three roots on M₂, whereas *M. topachevskii* has two.

Other characters typical of the new species are: the number of accessory ridges and the situation and details of development of all elements of the occlusal surface of the crowns. All these differences, besides those described above, are sufficient to justify the creation of a new species for the form from Grytsiv.

Genus *Myoglis* BAUDELLOT, 1965

Myoglis ucrainicus sp. nov.

Fig. 3-4

H o l o t y p e. M¹, No 22, 2098; Fig. 3:D. Dimensions: L = 1.75, W = 1.6.

D e r i v a t i o n o m i n i s. From the name of the Ukraine.

R e m a i n i n g m a t e r i a l. Fragment of left maxilla with P^4 - M^1 , isolated upper teeth: 3 left, 3 right P^4 , 7 left, 6 right M^1 , 3 left, 4 right M^2 , 1 left, 2 right M^3 , right mandible with P_4 - M_3 , isolated lower teeth: 4 right P_4 , 7 left, 8 right M_1 , 5 left, 6 right M_2 , 1 right M_3 . (No 22, 2090 - 2153).

L o c a l i t y. Grytsiv, Middle Sarmatian, zone MN 9.

D i a g n o s i s. P^4 with six to seven transversal ridges on the trapezoid occlusal surface of the crown. Accessory ridge between the posteroloph and metaloph always present. In about half of the specimens of M^{1-2} the protochord does not merge with the metaloph and posteroloph in the region of the protocone. M_1 has seven, M_2 seven or eight transversal ridges. The posterior accessory ridge behind the posterolophid is lacking.

D e s c r i p t i o n. Occlusal surface of premolars and molars is flat.

P^4 (Fig. 3:A, B) with three roots, its occlusal surface is trapezoid, with six to seven ridges. The posterior centroloph is lacking. Anterior centroloph as a rule well developed, extending lingually more than halfway across the crown, not confluent with the paracone. The lingual part of the anteroloph bends slightly backwards, in heavily worn teeth it sometimes joins the protocone.

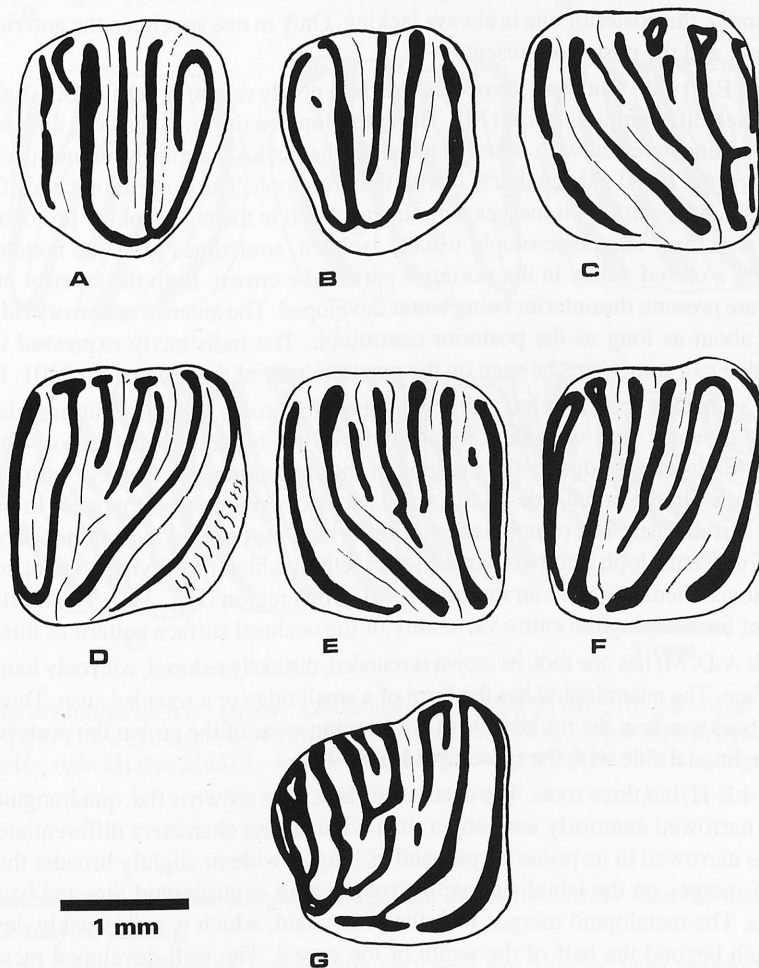


Fig. 3. *Myoglis ucrainicus* sp. nov., Grytsiv. Upper molars. A – left P^4 (No 2090), B – right P^4 (No 2091), C – left M^1 (No 2096), D – right M^1 (No 2098, holotype), E – left M^2 (No 2101), F – right M^2 (No 2103), G – right M^3 (No 2104).

Metaloph and protoloph always connected with the protocone. One specimen has an accessory ridge between them which merges labially with the posteroloph.

M¹ (Fig. 3:C, D) has four roots equal in size. On its occlusal surface there are five main ridges. Anteroloph and protoloph are lingually distinctly bend backwards. Anteroloph independent, sometimes (in two specimens) connected with the paracone by a narrow ridge. In half of the specimens the protoloph is lingually connected with the metaloph in the region of the protocone, forming a V-shaped figure. The labial border of the protoloph is connected with the paracone, which is as a rule isolated, and in two specimens joins the anterior accessory ridge, forming a bow-shaped element. The anterior and posterior centroloph are always present, well developed, generally isolated. The anterior centroloph is twice as long as the posterior and only in one case these proportions are reversed. The metaloph and posteroloph merge on the lingual and labial sides of the crown. On six specimens the connection does not exist on the labial side; in such cases it would have been exposed by further wearing of the crown. On one specimen the posteroloph bends towards the anterolingual corner of the tooth, extending half way across its occlusal surface. On another tooth the metaloph joins the posteroloph through a small transversal ridge slightly lingually to the middle of the crown (No 2096; Fig. 3:C). The anterior accessory ridge is nearly always present but small, the posterior one is always lacking. Only in one specimen the anterior accessory ridge is absent, and the posterior present.

M² (Fig. 3: E, F) with four roots, its occlusal surface nearly square in outline, but slightly broader than long, which differentiates it from M¹. The anteroloph on the lingual side is directed distinctly backwards and unconnected with other elements of the occlusal surface. In one specimen only a small bridge on the labial side connects it with the protoloph. The posteroloph ends free labially, lingually in 60 % of specimens it merges with the metaloph in the region of the protocone, forming a V-shaped structure. The posteroloph, usually isolated, sometimes joins the metaloph on both sides, forming a closed valley in the posterior part of the crown. Both the anterior and posterior centrolophs are present, the anterior being better developed. The anterior accessory ridge is always present and about as long as the posterior centroloph. The indistinctly expressed intermediate accessory ridge can sometimes be seen on the posterior part of the crown (No 2101; Fig. 3:E).

M³ (Fig. 3:G). One specimen has three, two others four roots. Occlusal surface triangular. The pattern of the crown is very variable. Characteristic of this tooth is the formation – on its lingual border – of a longitudinal ridge by the merging of the anteroloph successively with the protocone and posteroloph. On the labial side all main and accessory ridges are separated. In the middle of the occlusal surface there is a rounded depression, which may divide the anterior accessory ridge and the anterior centroloph into two parts. In the teeth in which this division is not complete, the above-mentioned elements have an irregular form in this region (Fig. 3:G). The existing material is insufficient for studying the entire variability of the occlusal surface pattern of this tooth.

P₄ (Fig. 4: A-D, M) has one root, its crown is rounded, distinctly reduced, with only four ridges on its occlusal surface. The anterolophid has the form of a small ridge or a rounded cusp. Three successive ridges bend backwards in the middle. With progressing wear of the crown the posterolophid may merge on the lingual side with the mesolophid (Fig. 4:B).

M₁ (Fig. 4:E-H) has three roots. The occlusal surface of its crown is flat, quadrangular in outline. It is usually narrowed anteriorly and longer than wide. These characters differentiate it from M₂ which can be narrowed in its posterior part and as long as wide or slightly broader than long. The anterolophid merges on the labial side with strongly built centrolophid directed backwards and lingualwards. The metalophid merges with the protoconid, which is only weakly developed and does not reach beyond the half of the width of the crown. The well-developed mesolophid and posterolophid are usually isolated, but sometimes merge together on the lingual side of the tooth. The centrolophid is worse developed than the other main ridges and is not connected with any of

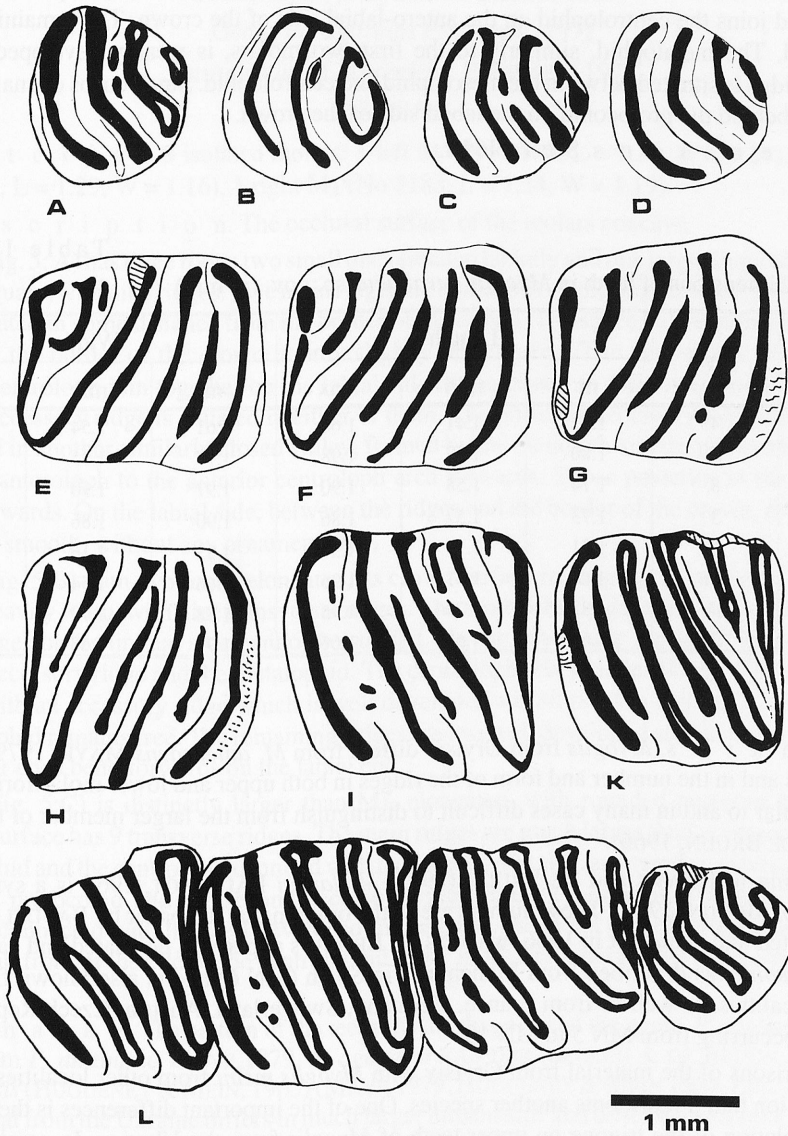


Fig. 4. *Myoglis ucrainicus* sp. nov., Grytsiv. Lower molars. A – right P₄ (No 2105), B – right P₄ (No 2106), C – right P₄ (No 2107), D – right P₄ (No 2108), E – left M₁ (No 2143), F – left M₁ (No 2144), G – left M₁ (No 2145), H – right M₁ (No 2146), I – left M₂ (No 2150), K – right M₂ (No 2151), L – right P₄ - M₃ (No 2142).

them. The anterior and posterior accessory ridges are distinctly smaller than the main ridges, the posterior one may be lacking.

M₂ (Fig. 4:I-L) has three roots. It is slightly narrowed and rounded in its posterior part. In the pattern of the occlusal surface it is nearly identical with the first molar. The only difference is that the posterior accessory ridge is better developed in M₂ than in M₁.

M₃ (Fig. 4:L) has three roots. It is distinctly smaller than M₂ but also rounded posteriorly. The anterolophid joins the centrolophid on the antero-labial side of the crown. The remaining ridges are isolated. The metalophid, similarly to the first two molars, is weakly developed. Unique accessory ridge is situated between the mesolophid and centrolophid. Small cusps of enamel occur before and behind the protoconid on the labial side of the crown.

D i m e n s i o n s. See Table III.

Table III

Dimensions of teeth in *Myoglis ucrainicus* sp. nov. (in mm)

| Tooth | n | Length | | | Width | | |
|----------------|----|--------|------|------|-------|------|------|
| | | m | min | max | m | min | max |
| P ⁴ | 4 | 1.52 | 1.41 | 1.66 | 1.61 | 1.54 | 1.75 |
| M ¹ | 14 | 1.80 | 1.52 | 1.98 | 1.77 | 1.55 | 1.95 |
| M ² | 8 | 1.74 | 1.58 | 1.90 | 1.97 | 1.90 | 2.07 |
| M ³ | 3 | 1.73 | 1.57 | 1.86 | 1.90 | 1.86 | 1.98 |
| P ₄ | 5 | 1.21 | 1.15 | 1.30 | 1.25 | 1.16 | 1.30 |
| M ₁ | 16 | 1.80 | 1.67 | 1.96 | 1.66 | 1.54 | 1.76 |
| M ₂ | 11 | 1.82 | 1.74 | 1.95 | 1.88 | 1.73 | 1.99 |
| M ₃ | 2 | 1.66 | 1.65 | 1.66 | 1.78 | 1.68 | 1.88 |

R e m a r k s. *Myoglis* from Grytsiv differs from *M. antecedens* MAYR, 1979 in larger dimensions and in the number and form of the ridges in both upper and lower molariform teeth. It is very similar to and in many cases difficult to distinguish from the larger member of the genus, *M. meini* (DE BRUIJN, 1966).

According to DAAMS and DE BRUIJN (1995) *M. larteti* BAUDELOT, 1965 is a synonym of *M. meini* (DE BRUIJN, 1966). These authors are of the opinion that the paper by BAUDELOT (1965) was antedated and came out in 1966, whereas DE BRUIJN's paper was postdated and came out in 1965. *M. meini* was described from Manchones in Spain (MN 6) and is also known from other Spanish localities, as well as from France, Germany, Switzerland, Austria, Czech Republic and Rumania, occurring from MN 5 to MN 10.

Comparisons of the material from Grytsiv with *Myoglis meini* from other localities led us to the conclusion that it represents another species. One of the important differences is the tendency towards isolation of the trigone on upper teeth of *Myoglis* from the Ukraine. In nearly half the specimens of M¹⁻² the protoloph, metaloph and posteroloph do not merge in the region of the protocone (in the remaining specimens only the metaloph and posteroloph join together, forming a horseshoe-shaped structure). On the same teeth of *M. meini* (BAUDELOT 1965, ENGESSER 1972) the metaloph and posteroloph unite in the form of the character W. M¹ of the dormouse from Grytsiv has four roots, those from Sansan and Anwil three roots. M₁ in the Ukrainian form has three roots, the specimens from Sansan and Anwil have two roots.

The number of ridges on lower molars is also different. In the Grytsiv sample M₁ has eight, M₂ seven to eight ridges. In the material from Sansan and Anwil posterior ridge is situated on the border of the crown, behind the posterolophid. Such a character is absent in the Ukrainian form.

The teeth of *M. ucrainicus* are distinctly narrower than in the Spanish material, smaller than in *M. larteti* from Sansan and identical with the specimens from Anwil.

Subfamily Dryomyinae DE BRUIJN, 1967

Genus *Paraglrirulus* ENGESSER, 1972*Paraglrirulus* cf. *werenfelsi* ENGESSER, 1972

Fig. 5:A-C

M a t e r i a l. 3 isolated molars: 1 left M^1 (No 2184, L = 1.21, W = 1.24), 1 right M_1 (No 2185, L = 1.29, W = 1.16), 1 right M_3 (No 2183, L = 1.34, W = 1.19).

D e s c r i p t i o n. The occlusal surface of the molars concave.

M^1 (Fig. 5:A) has three roots: two small ones situated labially and one larger lingually. Occlusal surface square, with nine ridges. Five main ridges are connected on the lingual side by a longitudinal ridge situated in some distance from the border of the crown. The space between this longitudinal ridge and the border of the crown is only slightly ornamented. The anteroloph, protoloph and anterior centroloph join together on the labial side of the crown to form two closed valleys. An isolated accessory ridge is situated in either of them. The posterior accessory ridge, also isolated, is situated in another similarly closed valley, formed by the metaloph and the posteroloph. Ridges from the anteroloph to the anterior centroloph arch forwards. Those posterior to the centroloph arch backwards. On the labial side, between the ridges and the border of the crown, the surface of enamel is smooth, without any ornamentation.

M_1 (Fig. 5:B) with two roots, elongated, its crown surface rectangular in outline. The occlusal surface heavily worn, with nine transversal ridges. The tooth is badly damaged so that the structure of the ridges on its lingual side cannot be studied. On the labial side the anterolophid joins the anterior accessory ridge and the metalophid. The centrolophid is well developed. The mesolophid merges with an accessory ridge which is well developed and situated in front of it. Conspicuous posterolophid remains free. The remaining ridges are less well developed and do not merge on this side. Their ends bend forwards on the labial end.

M_3 (Fig. 5:C) is distinctly larger than M_1 , elongated, with rounded posterior border. The occlusal surface has 9 transverse ridges. The main ridges are much larger than accessory ones. The anterolophid and the centrolophid, united with it on the lingual side, surround an anterior accessory ridge, the protoconid and the second accessory ridge situated behind it. The posterolophid is lingually connected with the well developed mesolophid, the labial end of which bends forward and ends in front of the end of the centrolophid. Four moderately developed accessory ridges are isolated.

R e m a r k s. The pattern of the teeth fits the diagnosis of the genus *Paraglrirulus* MAYR, 1979. From *P. diremptus* MAYR, 1979, *P. agelakisi* VAN DER MEULEN & DE BRUIJN, 1982), and *P. lissiensis* (HUGUENEY & MEIN, 1965) (MAYR 1979, HUGUENEY & MEIN 1965, ENGESSER 1972) the material from the Ukraine differs in much larger dimensions and different pattern of the molars. In *Paraglrirulus* from Grytsiv the number of ridges on both upper and lower molars is larger. The dimensions of M^{1-2} in the species listed above do not exceed one millimetre (MAYR 1979). The same teeth from Grytsiv are much larger and approach those of *P. werenfelsi* (ENGESSER, 1972) in size. A comparison of the data from the Ukraine with those concerning the populations of this last species from Western Europe (ENGESSER 1972, MAYR 1979) demonstrates their general similarity but shows also some differences. M^1 does not differ from its counterpart from Can Llobateres (ENGESSER, 1972, fig. 76), but differs from those collected in Anwil and Sansan (ENGESSER, 1972) in the division of its anterior centroloph on the labial side, and maybe also in the less strongly marked ornamentation on the lingual border of the crown. In our material there are nine ridges on the occlusal surface of M_1 , whereas in *P. werenfelsi* from Anwil there are eight. M_3 in the Ukrainian sample has the same pattern as M_3 from Germany (MAYR 1979, pl. XVI, figs. 9, 14) but differs from the tooth from Anwil which has nine and not eight ridges. The pattern of the occlusal surface of M_3 from Grytsiv is strikingly similar to that in figure of M_2 (?) from Anwil.

The limited number of specimens does not permit the definitive specific determination of the Ukrainian material of *Paraglrirulus*.

Genus *Miodyromys* KRETZOI, 1943

Miodyromys grycivensis sp. nov.

Fig. 5:D-I

H o l o t y p e. M_1 , No 22, 2171, Fig. 5:H. Dimensions: $L = 1.03$, $W = 0.89$.

D e r i v a t i o n o m i n i s. Named after the fossil locality Grytsiv.

L o c a l i t y. Grytsiv, Middle Sarmatian, MN 9.

R e m a i n i n g m a t e r i a l. 3 left, 4 right isolated molars M^{1-2} , 1 fragment of right mandible with M_2 (No 22, 2172-2177, 2186, 2187).

D i a g n o s i s. *Miodyromys* of small size, smaller than *M. hamadryas*. M^{1-2} have six main and one or two accessory ridges. The posterior accessory ridge is lacking (it is present in *M. hamadryas*). The anterior centroloph, longer than the posterior one, may join the protoleph to form a closed valley. Anteroloph, as a rule, isolated, merging with the paracone. M_1 lacks the anterior accessory ridge.

D e s c r i p t i o n. The occlusal surface of all molars is concave. M^{1-2} (Fig. 5:D-G) have three roots, one massive, situated lingually and two small labial ones. It is difficult to

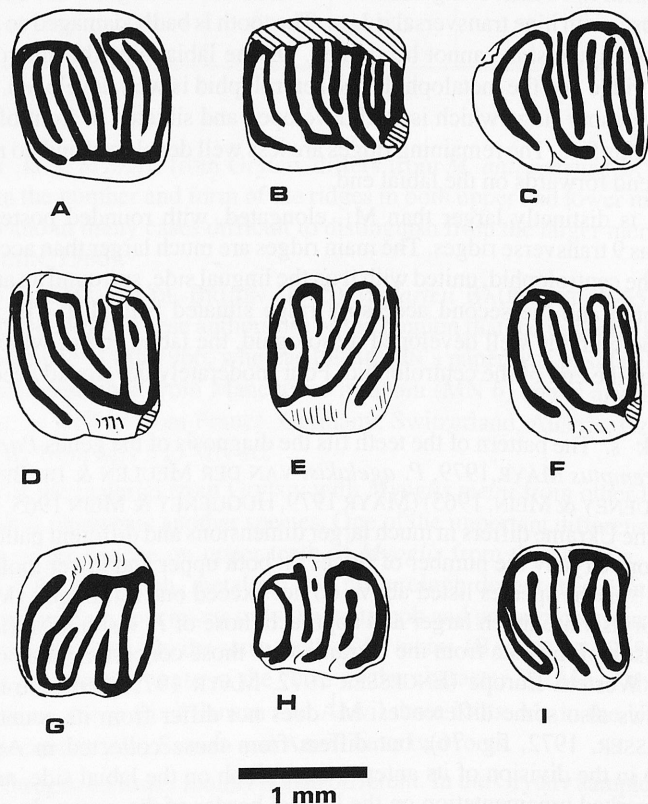


Fig. 5. A-C - *Paraglrirulus* cf. *werenfelsi*, Grytsiv. A - left M^1 (No 2184), B - right M^1 (No 2185), C - right M_3 (No 2183). D-I - *Miodyromys grycivensis* sp. nov., Grytsiv. D - left M^{1-2} (No 2173), E - right M^{1-2} (No 2174), F - left M^{1-2} (No 2175), G - right M^{1-2} (No 2176), H - left M_1 (No 2171, holotype), I - right M_2 (No 2172).

distinguish M^1 from M^2 because the pattern of their occlusal surface is nearly identical. These two teeth have six main ridges and one anterior accessory ridge which is not connected with other ridges. M^1 may be slightly larger. The anteroloph, isolated in young specimens, with progressing wear merges with the paracone on its labial side. Anterior centroloph, about twice as large as the posterior one, joins the protoloph in the region of the paracone. The posterior centroloph merges with the metaloph in the region of the metacone. The metaloph is connected with the posteroloph. Protoloph is inclined backwards and lingually, and on the lingual side is connected with the metaloph by a rather long ridge extending along the border of the tooth and also joining the metaloph to the posteroloph.

P₄ has one root, as shown by the alveole on the fragment of a mandible with M₂.

M₁ (Fig. 5:H) has three roots. Two anterior ones are minuscule, the third, much stronger, is situated in the posterior part of the tooth. M₁ is narrower in its anterior part. Its occlusal surface has five main ridges and one, isolated, posterior accessory ridge. The anterolophid, connected with the metalophid at both ends, limits a nearly regular oval field in the anterior part of the crown. The centrolophid is connected with this oval on the lingual side of the crown, in the region of the metaconid. The mesolophid and posterolophid join together to form a horseshoe - shaped structure. Its branches are directed forwards on the labial side of the crown, which is so owing to the greater length of the mesolophid. The small posterior accessory ridge is present in the valley limited by this horse-shoe.

M₂ (Fig. 5:I) has three roots. Its occlusal surface is nearly square, but its corners and the posterior border are rounded. It differs from the first lower molar in the presence of the anterior accessory ridge. All other elements of the occlusal surface of M₁ are also present in M₂: the anterior valley is, however, not oval because of a distinct shift of the metaloph towards the labial side of the crown. Nevertheless, the occlusal surfaces of both anterior lower molars are very similar.

D i m e n s i o n s. See Table IV.

Table IV

Dimensions of teeth in *Miodyromys grycivensis* sp. nov. (in mm)

| Tooth | n | Length | | | Width | | |
|------------------|---|--------|------|------|-------|------|------|
| | | m | min | max | m | min | max |
| M ¹⁻² | 7 | 1.07 | 0.99 | 1.22 | 1.19 | 1.07 | 1.24 |
| M ₁ | 1 | 1.03 | — | — | 1.07 | — | — |
| M ₂ | 1 | 1.06 | — | — | 1.03 | — | — |

R e m a r k s. The pattern of the occlusal surface of the teeth in the Ukrainian specimens is similar to that of *M. hamadryas* (MAJOR, 1899). It differs from the last in the lack of the posterior accessory ridge on M¹⁻², and in a higher number of roots in M₁ (the specimen from Grytsiv is three-rooted, in *M. hamadryas* this tooth has two roots), probably also in a smaller number of accessory ridges on the upper and lower molars and in the presence of morphotypes with the posteroloph and metaloph and the anteroloph and paracone merging on either side of M¹⁻². The specimens from Grytsiv have, in addition, smaller dimensions. From the similar species *M. vagus* MAYR, 1979 the form from Grytsiv differs, in the first place, in the merging of the protoloph and the anterior centroloph on the labial side of the crown (they are separated in *M. vagus*), and in a smaller number of the accessory ridges and therefore a more simple pattern of the occlusal surface in both upper and lower molars.

Miodyromys from Grytsiv has the same numbers of roots as *M. aegercii* (BAUDELLOT, 1972). In both species on M¹⁻² and on M₁₋₂ there are three roots. However, the glirid from Grytsiv differs

from *M. aegercii* in the form of the anterior centroloph on M^{1-2} , which in the Ukrainian species is better developed and does not merge with the posterior centroloph. As opposed to *M. aegercii* the glirid from Grytsiv lacks an intermediate ridge between the centrolophs.

From *M. biradiculus* MAYR, 1979 the Grytsiv species differs in stronger development of the centrolophs, particularly on M^2 , worse (in comparison with the centrolophs) developed anterior accessory ridge on M^{1-2} and in independent centrolophs, these ridges being united in *M. biradiculus* into one ridge which does not reach the interior border of the crown. Probably the glirid from Grytsiv is the smallest of all species studied with a similar pattern of teeth (BAUDELLOT 1972, BAUDELLOT & COLLIER 1982, MAYR 1979).

From other known species of the genus ours is distinctly different in the pattern and dimensions of its teeth. Its appearance is also chronologically distinctly different.

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