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THE MIDDLE MIOCENE (LATE ASTARACIAN, MN7-8) RODENT FAUNA OF FELSŐTÁRKÁNY 3/2 (HUNGARY)

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Abstract. The most important results of the study on the Felsőtárkány rodent fauna is given on the basis of the material collected between 2000 and 2002. The locality had been known from the twenties of the last century. A rich macroflora and a small vertebrate faunula were collected from the section. Between 1950 and 1999 scientific activity missed in this field. The author managed the new collecting campaign.

Keywords: Northern Hungary, Northern Hungary, Sarmatian, Non marine sediments, Microvertebrates

INTRODUCTION

The village Felsőtárkány is situated on the Southwestern foothill of the Bükk Mountains, to the North of the city of Eger. Fossil bearing Miocene non marine sediments were first described by SCHRETER (1913) from the vicinity of the settlement. The first systematic scholar of the land snail material was SÜMEGHY (1923, 1924). Ferenc Legányi, the best Hungarian self-educated fossil hunter during the twenties initiated the collection of the vertebrates from this site. The first publication of the vertebrate finds from Felsőtárkány, on some lagomorphs, belongs to ÉHIK (1926).

The paleobotanist Prof. Gábor Andreánszky and his students excavated this site immediately after the Second World War. They collected the Sarmatian macroflora of Felsőtárkány (ANDREÁNSZKY 1958, ANDREÁNSZKY & KOVÁCS 1955). The recent revision of this material was given by ERDEI (1999). After the fifties the field activity was interrupted and the erosional trenches -exposing the fossil-bearing sediments- begun to fill by rubbish, and a dense scrub of *Robinia* grown up.

The list of the vertebrate finds -collected during the twenties, without washing- was published by BALOGH & RÓNAI (1965) and KRETZOI (1982): *Galerix ehiki, Pliopithecus sp., Chloromys minutus, Leptodontomys sp., Amphilagus fontannesi, Proboscidea indet., Cervavitus sp.* KRETZOI (1982). They classified the faunula as Early Pannonian.

In 1999 the bone-bearing locality Felsőtárkány 1. was found by the present author and his students. This locality produced a small faunula: *Glirulus sp., Myoglis meini*, *Eomyops oppligeri, Keramidomys cf. mohleri, Megacricetodon sp., Anomalomys gaudryi*.

In 2000 another productive layer (Felsőtárkány 3/2) was found by the same team in an erosional trench 80 m NE from the yard of the wine bottling manufactory "Vitavin Kft.". Its lithostratigraphic position fits with the locality referred in the classic descriptions. During the last 3 years 8 tones of sediment were washed from this locality producing the rodent material discussed here below.

In the given length of the text monographic or complete systematic description is impossible.

The aim of this paper is to give preliminary information on the present status of the study of the fauna.

DESCRIPTION

CASTORIDAE

Trogontherium minutum (VON MEYER, 1838)
Plate I: Figures 1, 2, 3

Measurements (mm):

		No.	Min.	Max.	X
P4-M2	L	2	2.92	3.00	2.96
	W	3	2.50	2.82	2.70
p4	L	1	-	-	3.7
	W	1	-	-	2.92

We have hypsodont molars with flat chewing surface and with root formation. No cement in the re-entrants. The early finds were classified as *Chloromys minutus* by KRETZOI (1982). Beyond Felsőtárkány the species was found only in Rudabánya in the Middle Miocene of the Carpathian Basin (Kordos, personal communication 2002).

SCIURIDAE

Spermophilinus bredai (VON MEYER, 1848)
Plate I: Figures 6, 7, 8

Measurements (mm):

		no.	min.	max.	X
D4	L	2	1.29	1.30	1.295
	W	2	1.23	1.43	1.33
P4	L	3	1.40	1.48	1.43
	W	3	1.43	1.62	1.53
M1-2	L	11	1.58	1.72	1.659
	W	11	2.03	2.18	2.093
M3	L	5	2.0	2.20	2.11
	W	5	1.92	2.0	1.96
d4	L	1	-	-	1.32
	W	1	-	-	1.26
p4	L	2	1.54	1.68	1.61
	W	2	1.36	1.57	1.465
m1	L	4	1.58	1.75	1.677
	W	4	1.68	1.88	1.778
m2	L	5	1.76	1.93	1.874
	W	5	1.76	2.06	1.922
M3	L	5	2.11	2.20	2.162

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	W	5	1.92	2.10	1.988

The morphology of the available material refers to the descriptions of DE BRUIJN & MEIN (1968), CUENCA BESCOS (1988), ALDANA CARRASCO (1992). The most important morphological characters are as follow.

M1-2. The important elements of the toothcrown are the three main cusps and the four transversal enamel ridges. The largest cusp is the protocone. All the four ridges are converged toward this cusp. The anteroloph and the protoloph are transversally directed. The metaloph is slightly diagonal in antero-lingual -postero -buccal direction. The small cusp mesostyle is found in 3 M1-2.

m1-2. There are three main cusps and three enamel ridges in the toothcrown.. The anterolophid is connected to the metalophid. A small trigonid basin is found between these ridges especially in the unworn juvenile teeth. The surface of the tcentral (talonid) basin is smooth. The hypoconid and the metaconid are connected by a curved posterolophid. (entoconid is not developed.)

The size increase through time of the *Spermophilinus* molars was demonstrated by De Bruijn (1995, fig. 1.). The mean length of the 11 M1-2 molars from Felsőtárkány 3/2 is 1.659 mm. This value is close to that of the *S. bredai* populations from Çandir, Grat and Anwil.

Albanensia grimmi (Black, 1966)
Plate II: Figures 1, 2, 3, 4, 5, 6

Measurements (mm):

		no.	min.	max.	X
P3	L	2	1.5	1.6	1.55
	W	2	1.9	2.0	1.95
P4	L	1	-	-	4.32
	W	2	4.5	4.5	4.50
M1-2	L	4	3.3	3.62	3.46
	W	4	4.25	4.37	4.31
M3	L	2	3.8	3.88	3.84
	W	2	3.88	4.10	3.99
p4	L	2	3.67	3.80	3.73
	W	2	3.82	4.0	3.91
m1	L	2	3.37	3.42	3.39
	W	2	3.92	4.05	3.98
m2	L	2	3.55	3.62	3.585
	W	2	4.12	4.25	4.185
m3	L	2	4.37	4.47	4.42
	W	2	3.75	3.80	3.775

The dental morphology refers to the descriptions of BLACK (1966), MEIN (1970), MAYR & FAHLBUSCH (1975). On the basis of the relatively large dimensions of the Felsőtárkány finds the species *Albanensia albanensis* and *Albanensia sansaniensis* are possible to outclose. The most important morphological characters are as follow.

M1-2. Among the transversal ridges the anteroloph and the posteroloph are narrow and free of accessoric conelets. The protoloph and the metaloph are strongy built and high developed. These are converged towards the protocone forming a ''V pattern''. The protoloph bears a group of irregular secondary conelets and secondary ridges. These small ridges are directed into the valley between the anteroloph and the protoloph. Posteriorly to the paracone there is a mesostyle. The metalophe bears a big secondary cusp: the metaconule. Secondary ridges are found between the metacone and the posteroloph, and similarly between the metaconule and the posteroloph.

m1-2. The highest cusps are the protoconid, metaconid, hypoconid and the entoconid. The protoconid and the metaconid are connected by the anterolophid and the lower developed protolophid. The anterolophid bears a secondary cusp, the anteroconulid. In the lingual side of the mesoconid two small basins are developed. The margin of the central (talonid) basin is complicated by numerous irregular, secondary ridges. In the lingual side there are two secondary cusps: the mesostylid and the strong entoconulid. In the Carpathian Basin the species is known from Rudabánya.

Hylopetes sp.
Plate I: Figures 9, 10, 11

Measurements (mm):

		no.	min.	max.	X
d4	L	1	-	-	1.50
	W	1	-	-	1.72
P4	L	1	-	-	1.47
	W	1	-	-	1.61
M1-2	L	1	-	-	1.76
	W	1	-	-	2.04
m1	L	1	-	-	1.68
	W	1	-	-	1.47

The morphology refers to the description of BOUWENS & BRUIJN DE (1986) and BRUIJN DE (1995). The most important morphological characters are the following.

M1-2. The measurements are very similar to that of *Spermophilinus bredai* upper molars but on the labial side of the protocone there is a short and low developed mesoloph between the protoloph and the metaloph.

m1-2. In comparision with the lower molars of *Spermophilinus bredai* the most important differences are the presence of the anteroconulid, entoconid and mesostylid. There is a furrow between the entoconid and the mesostylid. The surface of the central (talonid) basin is sculptured and complicated by fine secondary ridges.

The available material is inadequat for exact determination. In the Carpathian Basin the genus is known from Rudabánya (*Hylopetes sp.)* (DAXNER-HÖCK & FEJFAR 2000) and Csarnóta 2. (*H. hungaricus*) (KRETZOI 1962).

Blackia miocaenica
Plate I: Figures 4, 5

Measurements (mm):

		no.	min.	max.	X
d4	L	1	-	-	1.08
	W	1	-	-	1.06
M1	L	1	-	-	1.26
	W	1	-	-	1.47
p4	L	1	-	-	1.46
	W	1	-	-	1.54
m1	L	3	1.27	1.41	1.34
	W	3	1.25	1.37	1.28
m2	L	2	1.40	1.41	1.405
	W	2	1.46	1.58	1.52
m3	L	2	1.61	1.65	1.63
	W	2	1.40	1.61	1.505

The morphology of the finely sculptured teeth refers to the original description of MEIN (1970). In the Carpathian Basin the species was found in Neudorf-Spalte (HOLEC & SABOL 1996), Rudabánya (DAXNER-HÖCK & FEJFAR 2000) and Csarnóta 2. (WEERD 1979).

GLIRIDAE

Muscardinus aff. *sansaniensis*
Plate III: Figures 2, 3

Measurements (mm):

		no.	min.	max.	X
M1	L	3	1.22	1.34	1.27
	W	3	1.13	1.200	1.17
M2	L	2	1.18	1.20	1.19
	W	2	1,12	1,19	1.15
M3	L	1	-	-	1.06
	W	1	-	-	1.23
m1	L	5	1.19	1.25	1.21
	W	5	1.01	1.13	1.07
m2	L	4	1.16	1.30	1.22
	W	4	1.02	1.26	1.16
m3	L	1	-	-	1.12
	W	1	-	-	1.05

Muscardinus sp.
Plate III: Figure 4

Measurements (mm):

		no.	min.	max.	X
M1	L	1	-	-	1.27
	W	1	-	-	0.97
m1	L	2	1.01	1.13	1.07
	W	2	0.88	0.97	0.925

The morphology of the M1 molars is rather variable and we can presume the presence of 2 taxa in the *Muscardinus* material. In 3 M1 the posterior centroloph is complete and the extra ridge is nearly completely developed (*M.* aff. *sansaniensis*). In one M1 these ridges are very week (*Muscardinus* sp.*).* At this moment the exact determination of the other species with more simple morphology would be inadequate. The morphology of the species *Muscardinus hispanicus (*BRUIJN DE 1966) and *Muscardinus topachevskii* NESIN & KOWALSKI *(1997)* is very similar, but these taxa were described from Early Vallesan faunas.

In the Carpathian Basin *M. aff. sansaniensis* is known from Mátraszőlős (GÁL et al 2000), Tâsad (Hír et al 2001a) and Felsőtárkány 1 (Hír et al 2001b). *Muscardinus hispanicus* was reported from Rudabánya (DAXNER-HÖCK & FEJFAR 2000).

Glirulus sp.
Plate III: Figure 8, 9, 10

Measurements (mm):

		no.	min.	max.	X
P4	L	1	-	-	0.87
	W	1	-	-	0.98
M1	L	2	1.04	1.20	1.12
	W	2	1.26	1.29	1.275
M2	L	1	-	-	1.22
	W	1	-	-	1.22
p4	L	2	0.80	0.84	0.82
	W	2	0.70	0.73	0.715
m1	L	1	-	-	1.19
	W	1	-	-	1.06
m2	L	2	1.20	1.29	1.245
	W	2	1.22	1.37	1.295

Paraglirulus aff. *werenfelsi*
Plate III: Figure 4

Measurements (mm):

		no.	min.	max.	X
M2	L	1	-	-	1.32
	W	1	-	-	1.43

The chewing surface of the M 1-2 molars is concave. The anterior centroloph is not connected to the endoloph. The connection of the posterior centroloph to the endoloph is complete. In the m1-2 the anterior extra ridge is doubled. Complete endolophid is not developed.The centrolophid and the mesolophid are connected on the buccal side. In the only *Paraglirulus aff werenfelsi* M2 the anterior centroloph is connected to the endoloph.

The co-occurence of *Glirulus lissiensis* and *Paraglirulus werenfelsi* is known from Rudabánya in the Carpathian Basin (DAXNER-HÖCK & FEJFAR 2000).

Myoglis meini BAUDELOT 1965,
Plate III: Figures 1, 5, 6, 7

Measurements (mm):

		no.	min.	max.	X
D4	L	2	0.87	0.95	0.91
	W	2	1.05	1.11	1.08
P4	L	2	1.41	1.47	1.44
	W	1	1.60	-	1.60
M1	L	4	1.75	1.90	1.797
	W	4	1.72	1.88	1.825

M2	L	5	1.65	1.75	1,69
	W	5	1.82	2.10	2.00
M3	L	4	1.46	1.75	1.61
	W	4	1.71	1.90	1.81
d4	L	1	-	-	1.13
	W	1	-	-	0.88
p4	L	1	-	-	1.23
	W	-	-	-	-
m1	L	4	1.71	1.89	1.78
	W	4	1.43	1.76	1.58
m2	L	1	-	-	1.90
	W	1	-	-	1.93
m3	L	2	1.78	1.82	1.80
	W	2	1.76	1.79	1.775

The morphology of this large sized glirid refers to the descriptions of BAUDELOT (1965) and ENGESSER (1972). In the Carpathian Basin the species is known from Comăneşti 1 (Feru et al 1980), Felsőtárkány 1 (HíR et al 2001b) and Rudabánya (DAXNER-HÖCK & FEJFAR 2000).

EOMYIDAE

Eomyops oppligeri ENGESSER 1990,
Plate III: Figure12.

Measurements (mm):

		no.	min.	max.	X
P4	L	1	-	-	0.71
	W	1	-	-	0.71
M1-2	L	4	0.74	0.84	0.79
	W	4	0.81	0.98	0.88
M3	L	1	-	-	0.62
	W	1	-	-	0.69
p4	L	2	0.76	0.78	0.77
	W	2	0.70	0.70	0.70
m1-2	L	4	0.69	0.87	0.78
	W	4	0.70	0.77	0.735

The series from Felsőtárkány 3/2 is similar in size *to E. oppligeri*, but smaller than *E. catalaunicus*. The early collected *"Leptodontomys sp."* p4 should also be refered to the same species. The material published by Kretzoi (1982) was possible to study in the collection of the Hungarian Geological Institute. Beyond Felsőtárkány *E. oppligeri* is known from Mátraszőlős in the Carpathian Basin (Gál et al 2000).

Keramidomys mohleri ENGESSER 1972
Plate III: Figure 13.

Measurements (mm):

		no.	Min.	Max.	X
P4	L	2	0.71	0.73	0.72
	W	2	0.83	0.87	0.85
M1-2	L	3	0.90	0.92	0.91
	W	3	0.94	0.98	0.96
M3	L	2	0.64	0.74	0.69
	W	2	0.80	0.98	0.89
d4	L	1	-	-	0.94
	W	1	-	-	0.66
p4	L	1	-	-	0.78
	W	1	-	-	0.73

The determination is mainly based on the measurements in comparision with the data of ENGESSER (1972, 1990). In the locality Felsőtárkány 1 a complete lower toothrow of this species was found (Hír et al 2001b). Beyond Felsőtárkány the species is known from Mátraszőlős in the Carpathian Basin (GÁL et al 2000).

CRICETIDAE

Megacricetodon minutus DAXNER 1967
Plate IV: Figures 3, 4, 8, 12, 14, 15, 16, 19.

Measurements(mm):

		no.	min.	max.	x
M1	L	10	1.32	1.47	1.38
	W	10	0.80	0.92	0.86
M2	L	5	1.05	1.12	1.08
	W	5	0.90	1.16	0.97
M3	L	3	0.71	0.77	0.74
	W	3	0.71	0.80	0.76
m1	L	7	1.30	1.39	1.34
	W	7	0.69	0.84	0.77
m2	L	5	1.02	1.08	1.06
	W	5	0.76	0.83	0.80
m3	L	9	0.85	0.98	0.92
	W	9	0.66	0.74	0.71

The morphology rather refers to *Megacricetodon minor* (AGUILAR 1980, HEISSIG 1989, BOLLIGER, 1994, KäLIN & ENGESSER 2001), but the mean dimensions are smaller.

The most important morphological markers are the following.

M1. The anterocone is bicuspid and asymmetrical. The buccal part is larger. The anterolophule is simple. Anteromesoloph and protolophule I. are not developed. The posterior spur (ectoloph) of the paracone is frequent. The mesolophe is short or middle developed.

m1. The anteroconid is unicuspid. More (2-3) cuspulae are found only in the anteroconid of a few juvenile molars. The lingual spur of the anterolophulid is frequent. The mesolophid is short or middle developed. A short ectomesolophid was found in one molar. In Hungary Felsőtárkány 3/2 is the only occurence of the species. In the Vienna Basin *M. minutus* is known from Bullendorf (MN8), Vösendorf, Inzersdorf and Richardhof 1 (MN9) (Daxner -Höck personal communication, 2002).

Eumyarion medius (LARTET 1851)
Plate III: Figures 14, 15, 16, 17.

Measurements:

		no.	min.	max.	X
M1	L	10	1.96	2.16	2.072
	W	10	1.48	1.64	1.56
M2	L	8	1.54	1.68	1.599
	W	8	1.46	1.68	1.576
M3	L	3	1.27	1.40	1.353

	W	3	1.40	1.46	1.43
m1	L	9	1.92	2.10	1.997
	W	9	1.19	1.40	1.297
m2	L:	9	1.61	1.76	1.698
	W	8	1.33	1.54	1.444
m3	L:	3	1.50	1.64	1.58
	W	3	1.26	1.40	1.317

These finds belong to a middle sized *Eumyarion* species. The most important morphological characters are the following.

M1. The anterocone is bicuspid in the juvenile teeth, but the fusion of the cuspulae taken place in a very early stage of wear. The anterolophule is one or two branched. In the earlier case an anteromesolophe is developed, which is connected to the buccal cusp of the anterocone. The mesolophe is long but does not reach the buccal margin of the toothcrown.

m1. The anteroconid is unicuspid. The anteroconid and the metaconid are connected by a short antero-lingual cingulum. The metalophid is short and connected to the anterolophulid before the protoconid. The mesolophid is connected to the metaconid. The ectomesolophid is variabile in length. The genus is represented in nearly every Middle Miocene faunas of the Carpathian Basin. Up to the present there are no evidences of time - consequent changes in the dimensions and in the morphology of the Eumyarion finds of the region.

Collimys n. sp.

Plate IV: Figures 1, 2, 5, 6, 7, 9, 10, 11, 13, 17, 18.

Measurements (mm):

		no.	min	max.	X	SD
M1	L	76	1.85	2.21	2.001	0.067
	W	79	1.15	1.41	1.276	0.046
M2	L	82	1.40	1.67	1.531	0.044
	W	80	1.18	1.40	1.288	0.034
M3	L	43	1.16	1.41	1.301	0.047
	W	43	1.08	1.33	1.206	0.045
m1	L	76	1.71	2.09	1.857	0.062
	W	76	1.06	1.30	1.187	0.037
m2	L	77	1.43	1.68	1.560	0.043
	W	76	1.12	1.43	1.265	0.040
m3	L	50	1.39	1.72	1.538	0.056
	W	50	1.06	1.37	1.164	0.045

This brachyodont *Collimys* species is the dominant hamster and also the dominant rodent of the fauna. The detailed systematic description of this new species will be given in another paper (Hír 2004). Here only the most important morphological characters are given.

M1. The anterocone is broad and undivided. The anterolophule is short and it is always connected with a highly developed anteromesolophe. The presence of the protolophule I is rare. The mesolophe is highly developed, long or middle in length.

M2. One of the most importan characters of the genus *Collimys* -the missing of the lingual anterolophule- does not apply to our species. The complete missing of this element was observed only in 5% of the M2 molars (Plate IV, Figure 6.). In the majority of the specimen the lingual anterolopule (= antero -lingual cingulum) is more or less developed.

m1. The anteroconid -anterolophulid region is extremely variabile. Four morphotype -groups were described. The most frequent variation is the two cusped anteroconid and the two branched (V -shaped) anterolophulid. The lingual branch of the anterolophulid is connected with the lingual cusp of the anteroconid. The buccal branch of the anterolophulid is connected with the anterobuccal cingulum of the anteroconid. The mesolophid is high developed and reaches the lingual margin of the toothcrown. A short ectomesolophid is frequent.

Our species is very similar to *Democricetodon freisingensis*. The differences are the deeper and narrower synclines and synclinids and the stronger and higher built transversal ridges (anteromesolophe, mesolophe, mesolophid). In the adult molars of *Collimys n. sp*. the flat chewing surface is developed involving the transversal ridges.

The *Collimys* species are usually rare elements of the Central European Middle Miocene faunas. E.g. *Collimys transversus* (HEISSIG 1995) or *Collimys longidens* (KäLIN & ENGESSER 2001). In the fauna of Felsőtárkány 3/2 54.5 % of the intact rodent molars were determined as *Collimys sp*. The paleooecological background of this *Collimys* invasion is not understood in this moment.

ANOMALOMYIDAE

Anomalomys gaudryi

Measurements (mm):

		no.	min.	max.	X
M1	L	20	1.54	1.83	1.73
	W	20	0.54	1.74	1.25
M2	L	19	1.37	1.68	1.57
	W	19	0.77	1.47	1.07
M3	L	8	0.91	1.20	1.08
	W	8	0.91	1.26	1.09
m1	L	24	1.69	2.03	1.84
	W	24	0.76	1.33	1.08
m2	L	20	1.61	2.10	1.78
	W	20	0.80	1.43	1.20
m3	L	16	1.29	1.61	1.43
	W	15	0.88	1.29	1.11

A detailed analysis of the *Anomalomys* molars were published by HÍR (2002) on the basis of 42 molars collected in 2001. Here only the most important characters are given.

M1. The flat occlusal surface consists of three enamel -folds: anteroloph, medioloph, posteroloph. The folds are divided by one lingual sinus and two buccal sinuses. Enamel rings are found in the buccal parts of the folds. During the wearing process the rings become smaller. Distinct mesolophe is not

developed in the M1, M2. This element is missing in the juvenile teeth as well. Based on this character, the Felsőtárkány population can be regarded as more advanced than *A. gaudryi* from La Grive and Anwil (ENGESSER 1972).

m1. The flat occlusal surface is elongated and divided into four enamel folds: anteroconid, paraconid, metaconid, posterolophid. The disappearence of the interior enamel rings of the anteroconid and the anteroconid -paraconid fusion is developed only in the senile stage. The relation of the paraconid and the metaconid strongly differs from the configuration of *Anomalomys rudabanyensis* KORDOS (1989).

m2. The occlusal surface is three parted, because the paraconid and the metaconid are merged into a mediolophid during a very early stage of wear. On the basis of these morphological characters we cannot presume any evolutionary relationships with *Anomalomys rudabanyensis*.

THE BIOCHRONOLOGICAL POSITION

In the early literature there were two different ideas on the age of the locality Felsőtárkány. In the opinion of ANDREÁNSZKY (1958) and ANDREÁNSZKY & KOVÁCS (1955) the flora is Sarmatian. The early collected vertebrate faunula was regarded as Early Pannonian by KRETZOI (1982). (In the section the layer containing the fossil flora is situated above the bone -bearing level.)

In the light of the recently collected rodent material we can put the fauna into the Sarmatian and into the late MN 7-8 zone. The most important arguments are the followings:

- Sarmatian nonmarine mollusc fauna (Kókay oral communication, 2003)

- the morphology of the *Anomalomys* material is more advanced (simplified) than in *A. gaudryi* from La Grive and Anwil but more complicated than in *A. rudabanyensis* (MN9).

- in the morphology of the *Collimys* material there are some archaic characters (e.g. the presence of lingual anterolophule in the M2 molars) which are missing in the population of *Collimys longidens* from Nebelbergweg (MN 9) (Kälin & Engesser, 2001).

Under the fossiliferous freshwater series there is a reworked rhyolitic tuff complex. This complex is a part of the so colled "upper rhyolitic tuff", which is a characteristic niveau in the Miocene of Northern Hungary. The K -Ar age of this tuff was found 13.7 +- 0.8 million years by MÁRTON & PÉCSKAY (1998).

THE PALEOOECOLOGICAL RECONSTRUCTION

The absolute dominant elements of the fauna are the *Collimys n. sp.* and the *Anomalomys gaudryi.* In the Late Miocene Turolian faunas the species of these two genera are undoubtedly adapted to the grassland vegetation. It is reflected in their tendency for hypsodonty.

In the Late Astaracian the two genera are only in the beginning of this process and -according to the paleobotanical data- we cannot presume extended grassland vegetation. In the paleoflora there is a great deal of the ferns, because those were able to tolerat the semi -darkness of the subtropical forest (ERDEI 1999). This supposition is confirmed by the coexistence of the three flying squirrels in the rodent fauna. These facts considered we can presume a forest environment. with different levels of foliage.

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PLATES

PLATE I

Castorid ans sciurid remains from *Felsőtárkány 3/2.*
Figure 1: occlusal view of *Trogontherium minutum* M1-2.
Figures 2,3: lateral views of *Trogontherium minutum* M1-2.
Figure 4: occlusal view of *Blackia miocaenica* M 1-2.
Figure 5: occlusal view of *Blackia miocaenica* m3.
Figure 6: occlusal view of *Spermophilinus bredai* P4.
Figure 7: occlusal view of *Spermophilinus bredai* M1-2.
Figure 8: occlusal view of *Spermophilinus bredai* m2..
Figure 9: occlusal view of *Hylopetes sp.* P4.
Figure 10: occlusal view of *Hylopetes sp.* M1-2.
Figure 11: occlusal view of *Hylopetes sp.* m1.

PLATE II

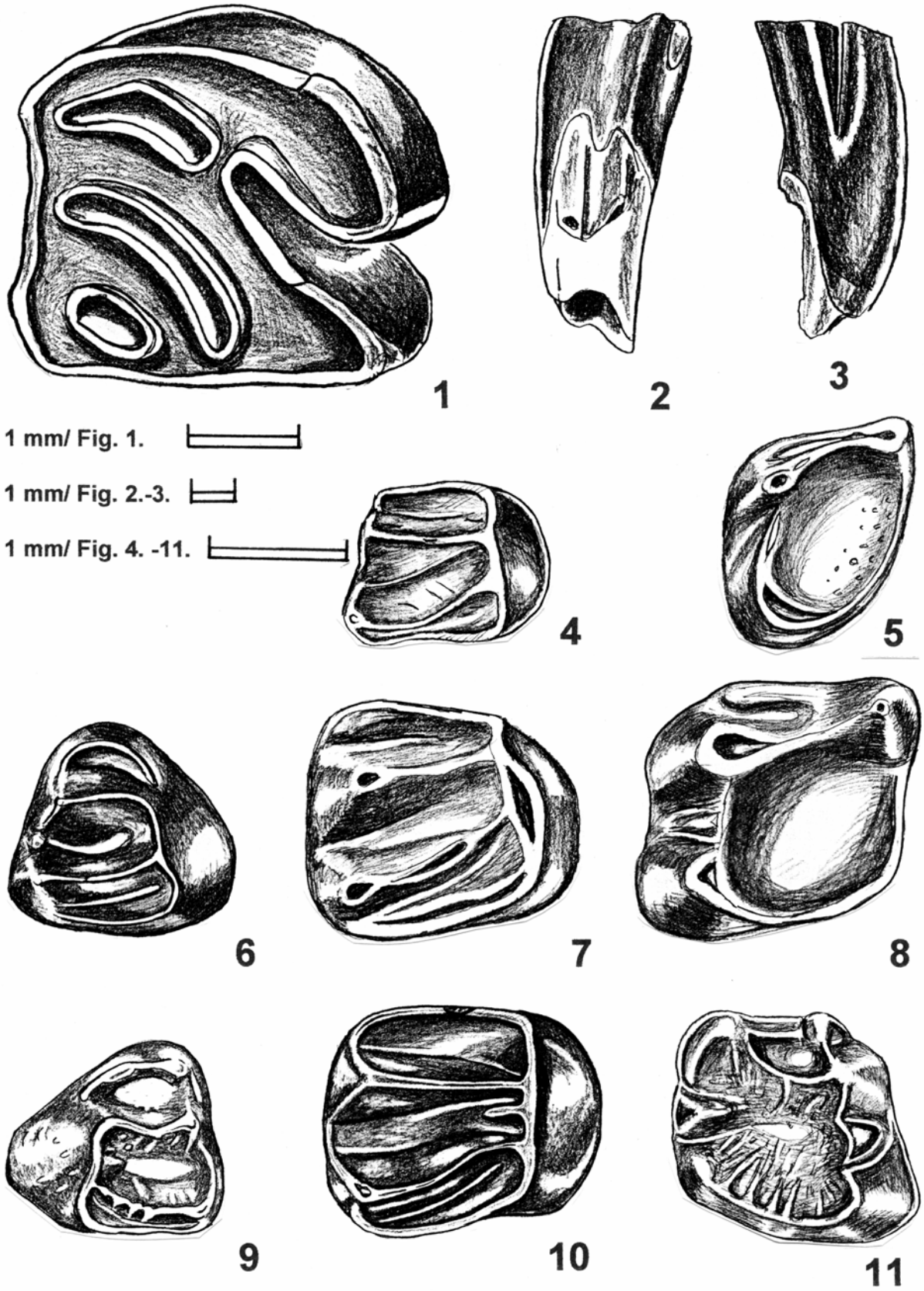
Occlusal views of *Albanensia grimmi* molars from Felsőtárkány 3/2
Figure 1: p4 Figure 2: P4 Figure 3: m1 Figure 4: M1 Figure 5: m3 Figure 6: M3

PLATE III

Glirid and cricetid remains from Felsőtárkány 3/2.
Figure 1: occlusal vuew of *Myoglis meini* d4.
Figures 2, 3: occlusal views of *Muscardinus aff. sansaniensis* M1.
Figure 4: occlusal view of *Muscardinus sp*. M1.
Figure 5: occlusal view of *Myoglis meini* m2.
Figure 6: occlusal view of *Myoglis meini* M3.
Figure 7: occlusal view of *Myoglis meini* M2.
Figure 8: occlusal view of *Glyrulus sp*. m2.
Figure 9: occlusal view of *Glyrulus sp*. M1.
Figure 10: occlusal view of *Glyrulus sp.* M2.
Figure 11: occlusal view of *Paraglirulus aff. werenfelsi* M2.
Figure 12: occlusal view of *Eomyops oppligeri* M1-2.
Figure 13: occlusal view of *Keramidomys mohleri* M1-2.
Figure 14: occlusal view of *Eumyarion medius* M1.
Figure 15: occlusal view of *Eumyarion medius* M2.
Figure 16: occlusal view of *Eumyarion medius* m1.
Figure 17: occlusal view of *Eumyarion medius* m2.

PLATE IV

Cricetid remains from Felsőtárkány 3/2.
Figures 1,2: occlusal view of *Collimys n. sp*. M1.
Figures 3,4: occlusal view of *Megacricetodon minutus* M1.
Figures 5,6,7: occlusal view of *Colimys n. sp*. M2.
Figure 8: occlusal view of *Megacricetodon minutus* M2.
Figures 9, 10, 11: occlusal view of *Colimys n. sp*. M3.
Figure 12: occlusal view of *Megacricetodon minutus* M3.
Figure 13: occlusal view of *Collimys n. sp*. m1.
Figures 14, 15: occlusal views of *Megacricetodon minutus* m1.
Figure 16: occlusal view of *Megacricetodon minutus* m2.
Figure 17, 18: occlusal views of *Collimys n. sp.* m3.
Figure 19: occlusal view of *Megacricetodon minutus* m3.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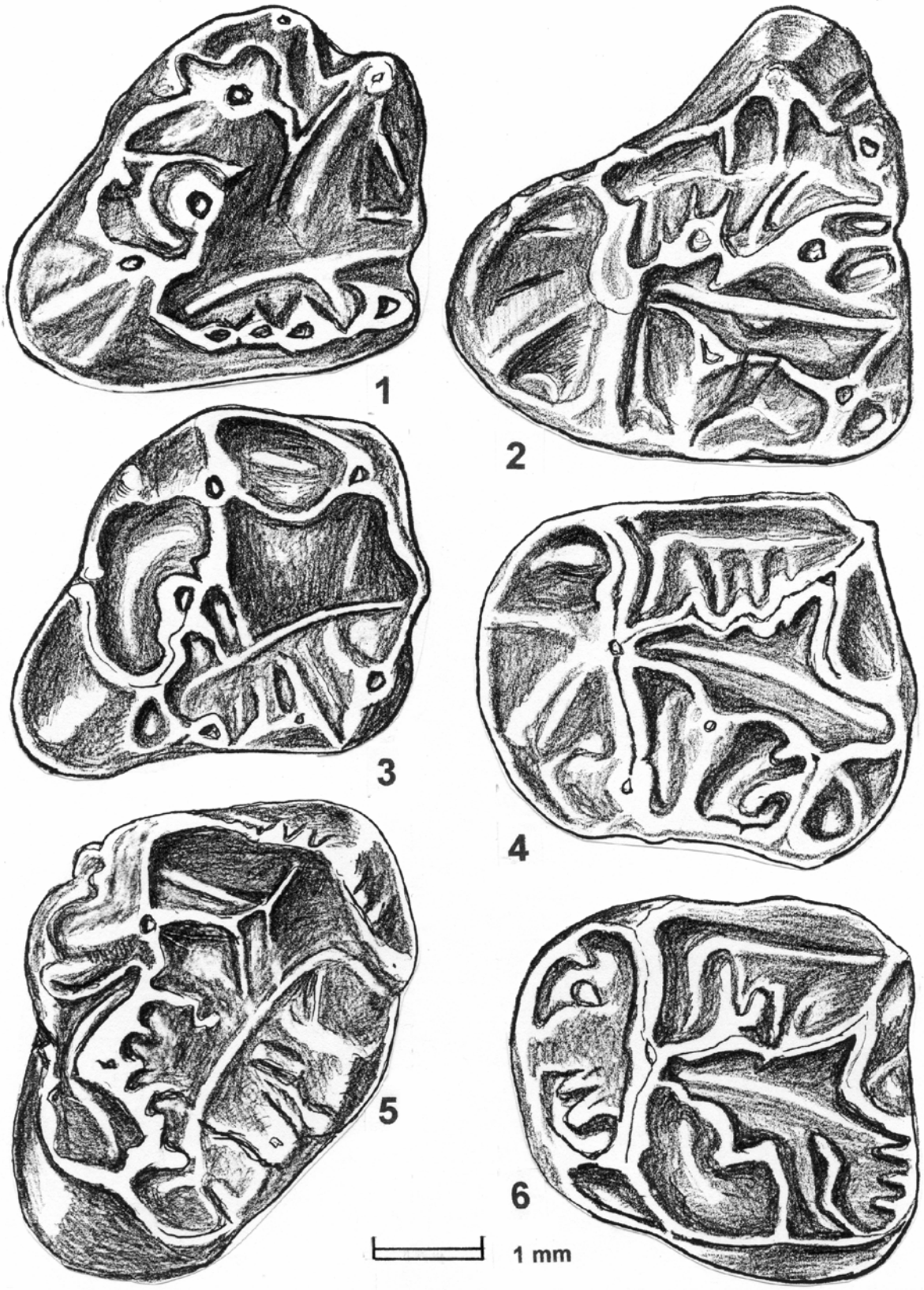
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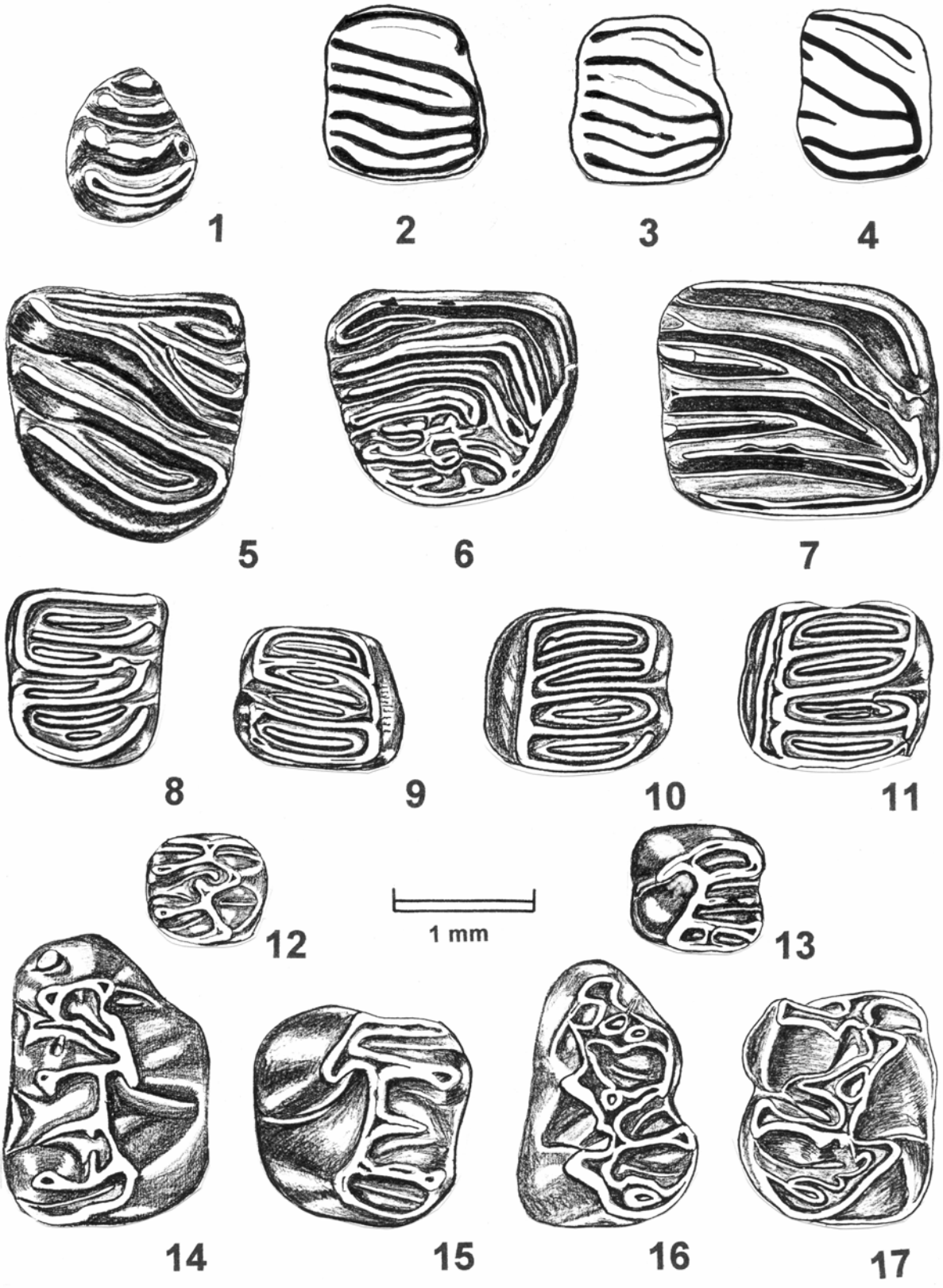
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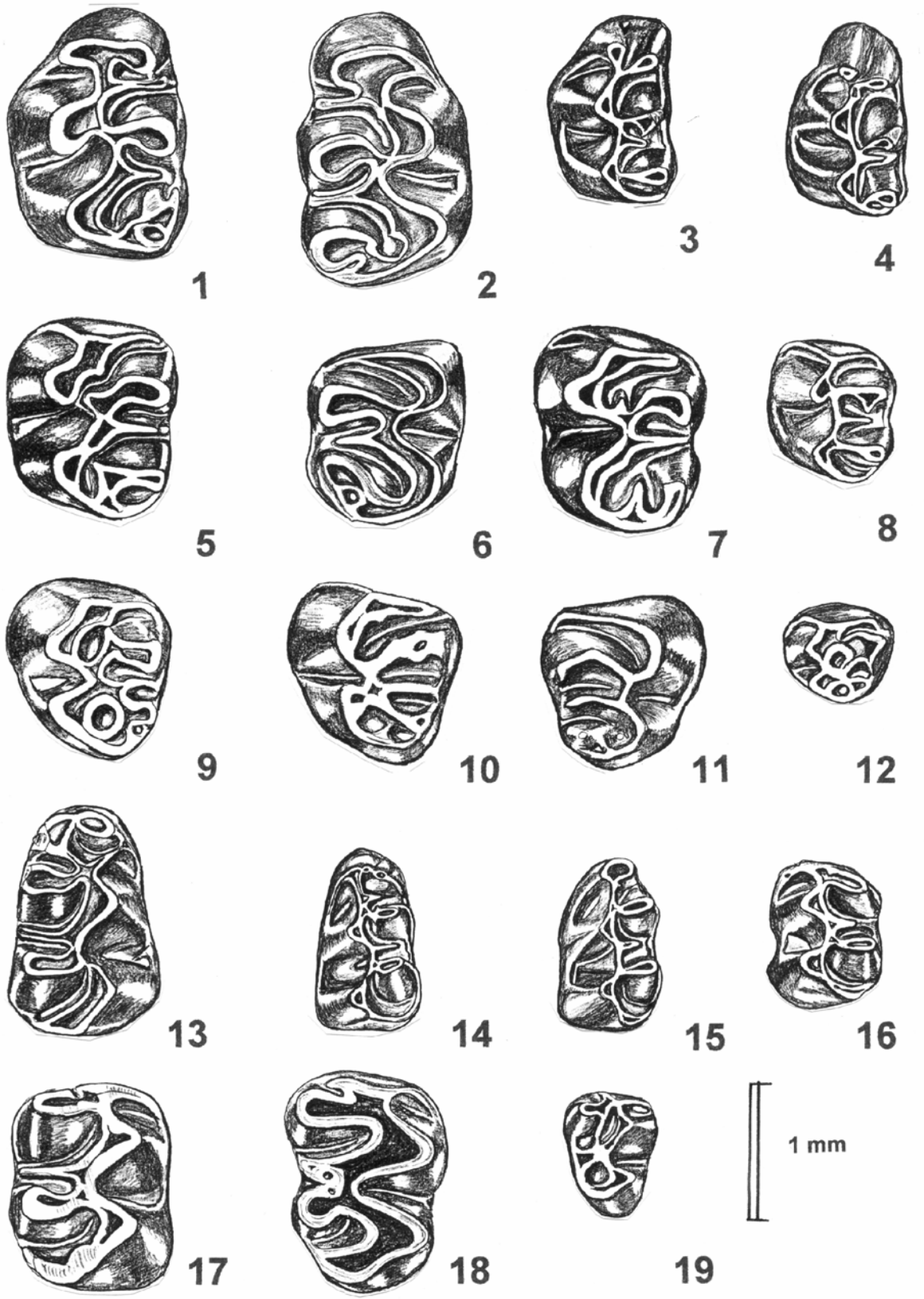
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