

Pliocene voles (*Pliomys*, Arvicolinae, Rodentia) from Odessa Catacombs

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ABSTRACT. The primitive arvicolid from the fauna of Odessa Catacombs (terminal Ruscinian, MN15, Early Pliocene) is described as a new species of the genus *Pliomys*, *P. destinatus* sp. nov. This form is more advanced than *Pliomys kowalskii* from Late Ruscinian faunas of Moldova and Ukraine in stronger reduced mimomyian ridge and enamel islet of first lower molar. *P. destinatus* sp. nov. is supposed to be a direct ancestor of Early Villanyian (MN16, Middle Pliocene) *Pliomys jalpugensis* from southern Ukraine.

KEY WORDS: Arvicolinae, evolution, Ruscinian, Early Pliocene, Odessa, Ukraine.

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Плиоценовые полевки (*Pliomys*, Arvicolinae, Rodentia) из Одесских Катакомб

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РЕЗЮМЕ. Архаичная полевка из фауны Одесских Катакомб (терминальный русциний, MN15) описывается как новый вид рода *Pliomys*, *P. destinatus* sp. nov. Эта форма более прогрессивна, чем *Pliomys kowalskii* из фаун позднего русциния Молдовы и Украины в большей редукции мимомисного выступа и эмалевого островка на первом нижнем моляре. Предполагается, что *P. destinatus* sp. nov. является прямым предком *Pliomys jalpugensis* из раннего виллания (средний плиоцен) южной Украины.

КЛЮЧЕВЫЕ СЛОВА: Arvicolinae, эволюция, русциний, ранний плиоцен, Одесса, Украина.

Introduction

The fauna of Odessa Catacombs is among the few fissure fillings known in the northern Black Sea region. Moreover, it is the only one of the Ruscinian age. The abundantly fossiliferous red clays fill the system of karst cavities in the Lower Pontian limestone within the city of Odessa (Ukraine). The caves were exposed by limestone mining in the first half of the last century. Rich bone materials were discovered in 1928 by T.G. Gritzai and later excavated by the paleontological expedition of the Ukrainian Academy of Sciences (Gritzai, 1938). The mammal fauna of the site is under continuous study since that time. Bones of the camel *Paracamelus alexejevi* (Havesson, 1950) are predominant among remains of large mammals. Also numerous and diverse are carnivorous mammals (for the review see Sotnikova, 2004).

Small mammals were described and discussed in a number of publications. They were dedicated to murids (Argyropulo & Pidoplichko, 1939a), lagomorphs (Argyropulo & Pidoplichko, 1939b; Gureev, 1964), beavers (Goretsky, 1943), spalacids (Topachevsky, 1969), hamsters (Topachevsky & Scorik, 1992), preliminary data on arvicolids (Gromov & Polyakov, 1977; Topachevsky & Nesin, 1989). Topachevsky *et al.* (1998)

and Nesin & Nadachowski (2000) reviewed the taxonomic list of the locality. By now the small mammals of the Odessa Catacombs include *Ochotona* sp., *Proochotona gigas* Argyropulo & Pidoplichka, 1939, *Alilepus ucrainicus* Gureev, 1964, *Trogotherium* sp., *Nannospalax odessanus* (Topachevsky, 1969), *Orientalomys similis* (Argyropulo & Pidoplichka, 1939), *Odesamys palatocristatus* Topachevsky & Scorik, 1992, *Cricetinus gritzaii* Topachevsky & Scorik, 1992, *Pliomys destinatus* sp. nov., *Promimomys* sp.

Most researchers date the mammal association of the Odessa Catacombs to the Late Ruscinian, MN15 (Pevzner *et al.*, 1996; Topachevsky *et al.*, 1998; Nesin & Nadachowski, 2000).

This paper gives a description of arvicolid material from Odessa Catacombs, the most abundant, but up to now poorly studied element of the small mammal fauna of this locality.

Material

The study is based on materials (collection EMM-20) stored in the Geological Institute of the Russian Academy of Sciences (GIN). They were collected in 1989–1990 by the field parties of GIN led by M.A. Pevzner and the author. Limited but important material

was given to me by K.K. Pronin in 1999. In addition, I had a chance to study the original materials of the expedition led by T.G. Gritzai in 30–40-s of the 20th century, which are currently preserved in the National Natural History Museum of the National Academy of Sciences of Ukraine, Kiev; in the Paleontological Museum of the Odessa State University (collection OSM-3825), and in the Zoological Institute of the Russian Academy of Sciences in St. Petersburg.

Terminology and abbreviations. The terminology of occlusal elements of vole molars is according to van der Meulen (1973). Terms for enamel-dentine boundary (*linea sinuosa*) in dentition of rhizodont voles are after G. Rabeder, (1980): HH-index, the square root of the sum of heights of dentine tracts of hypoconid and hypoconulid in lower molars; PA-index, the square root of the sum of heights of dentine tracts of protocone and anterocone in upper molars; ASD — anterosinuid, HSD — hyposinuid, HSLD — hyposinulid, DS — distosinus, AS — anterosinus, ASL — anterosinulus, PRS — protosinus. Σ _tract and Σ _tract/L are respectively sum of tracts heights and index of the latter to the occlusal length of the molar (Nesin, 1988). Lower case m stands for lower molars; upper case M, for upper molars. GIN: Geological Institute of the Russian Academy of Sciences, Moscow. OSM: Odessa State Museum, Ukraine.

Systematic Paleontology

FAMILY CRICETIDAE FISCHER VON WALDHEIM, 1817

Subfamily ARVICOLINAE Gray, 1821

Genus *Pliomys* Méhely, 1914

Pliomys Méhely, 1914: 195–198; *Apistomys* Méhely, 1914: 203; *Propliomys* Kretzoi, 1959: 237–246.

Pliomys destinatus sp. nov.

Figs. 1–12, Tables 1–6.

Pliomys odessanus nom. nud.: Gromov & Polyakov, 1977: 118.

Etymology: *destinatus*, from Latin resolute, determined.

Holotype. OSM-3825/01, right mandible fragment with m1 (2.9 · 1.1 mm) and m2 (1.85 · 1.05 mm). Paratype: GIN EMM-20/8, right m1, 2.45 · 0.95 mm.

Referred material: 16 m1, 17 m2, 17 m3, 27 M1, 20 M2, 18 M3 (GIN EMM-20).

Additional studied material: 1 fragmentary mandible with m1–m3 (GIN EMM-20/14), 2 fragmentary right mandibles with m1 and m2, (OSM-3825/02, 3825/03), and isolated m1 (3825/04).

Type locality. Odessa Catacombs, fossiliferous red clays filling karstic cavities in the Pontian limestone in Odessa, Ukraine.

Stratigraphic level. Late Ruscinian, MN15, Lower Pliocene.

Diagnosis: Species with m1 showing posterior lobe, three basic triangles, and anteroconid incompletely differentiated into T4 and T5 and rounded anterior cap. Mimomyian ridge nearly reduced and manifested as flattened tip of BSA3. Insular re-entrant deep, occasionally insulates at late stages of crown abrasion. In m1 HH-index ranges from 0.4 to 0.7; index of sum of tracts between 65 and 75. M3 with short-living anterior and posterior enamel islets, rarely co-occurring simultaneously at certain wear stage.

Differential diagnosis. The new species differs from *Pliomys kowalskii* Schevtschenko, 1965 in more reduced mimomyian ridge, and higher hypsodonty with mean HH-index more than 0.5; it differs from *P. jalpugensis* Nesin, 1983 in, on the contrary, less reduced mimomyian characters (ridge and islets) and less hypsodont molars. From *P. hungaricus* (Kormos, 1934) and *P. ucrainicus* (Topachevsky & Scorik, 1967) it differs in rounded anteroconid cap without additional triangles T6 and T7, from the former species it additionally differs by mostly two-rooted M3.

Description. Medium size primitive brachyodont vole with enamel undifferentiated or weakly thinning in the tips of reentrant folds. The schmelzmuster is of the protopachyknem type. Trailing edges show tangential enamel, and leading edges near the tips of the triangles display some primitive lamellar enamel.

Lower jaw. A fragmental left mandible (GIN EMM-20/14), belonging to a senile individual, preserves mor-

Table 1. Measurements and indices of *Pliomys destinatus* sp. nov., m1, Odessa Catacombs.

	n	Mean	Minimum	Maximum	Std.Dev.	Std. error	CV
LENGTH	9	2.68	2.45	2.95	0.1622	0.0541	6.06
WIDTH	14	1.13	0.95	1.25	0.0932	0.0249	8.24
ASD	9	1.12	1.00	1.35	0.1228	0.0409	10.94
HSD	9	0.51	0.40	0.60	0.0682	0.0227	13.49
HSLD	9	0.26	0.15	0.40	0.0982	0.0327	38.45
HH-INDEX	9	0.57	0.43	0.72	0.0868	0.0289	15.18
A/L	9	46.38	38.60	52.83	4.4054	1.4685	9.50
Σ _tract	7	1.89	1.75	2.10	0.1239	0.0468	6.55
Σ _tract/L	7	71.64	67.31	73.47	2.0697	0.7823	2.89

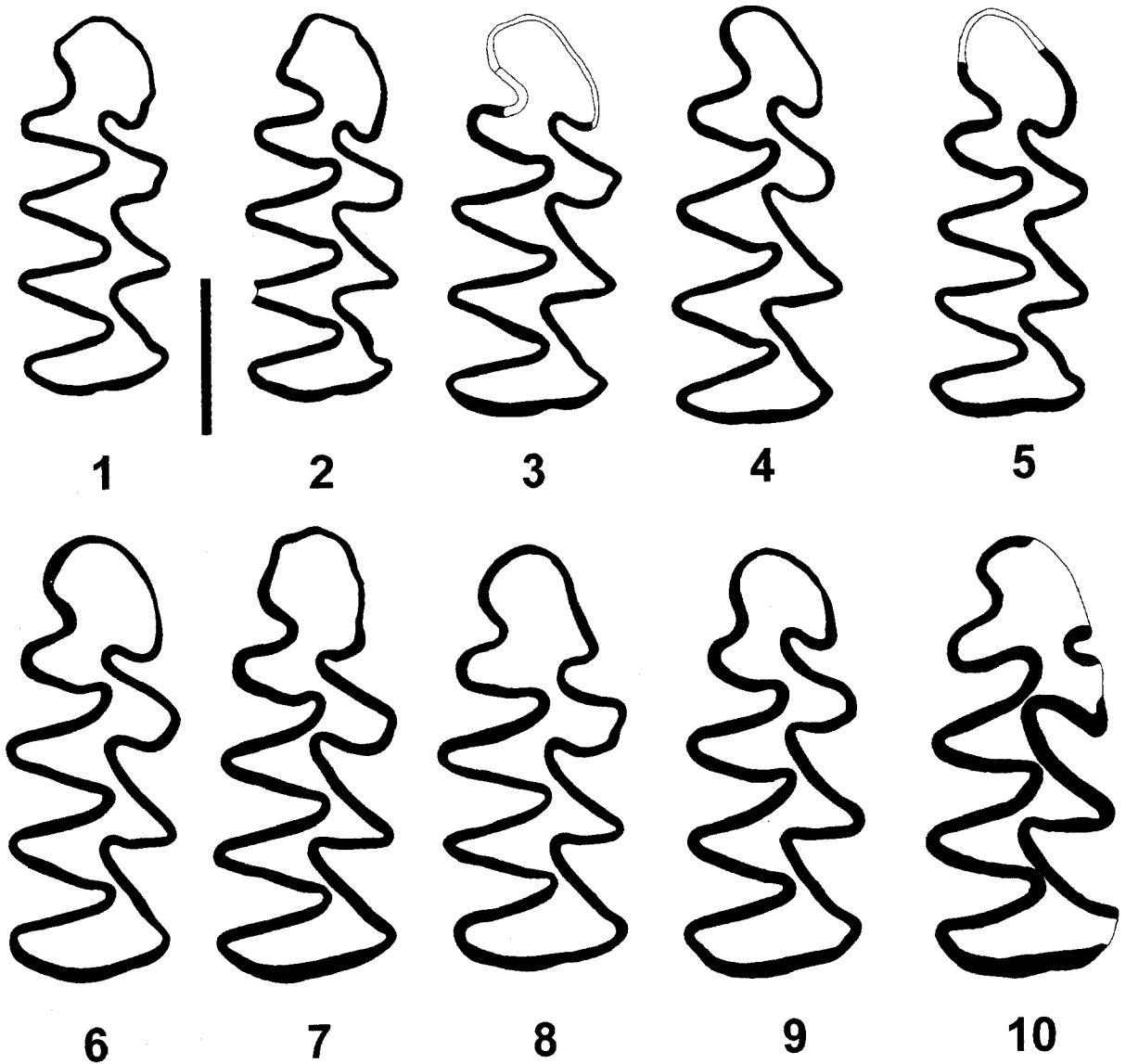


Figure 1. *Pliomys destinatus* sp. nov., m1, 1–10: occlusal surface. 1. 20/8: paratype, 2. 20/2, 3. 20/9, 4. 3825-04, 5. 20/12, 6. 3825-01: holotype, 7. 20/11, 8. 20/13, 9. 20/4, 10. 20/14. 5, 7, 8, 10: reversed. Scale bar 1 mm.

phology of its distal part and especially articular process (Fig. 9: 3). Distal end of the incisor forms a clear alveolar bulge on the outer side of the ascending part of mandible at the level slightly above the dental foramen. The height of the articular process above the occlusal plane amounts to 50% of the mandible height. The angle between the occlusal plane and the line drawn from the symphysis angle tangentially to the angular process (α angle) is about 15° . The articular process is set at an angle of ca. 58° to the occlusal plane of lower molars (β angle). Two other studied mandibular fragments are more damaged and represent juvenile (Fig. 9: 1) and adult animals (Fig. 9: 2).

m1 (Tab. 1, Figs. 1–2). Two roots. Rarely, a third small labial rootlet can be present (Fig. 2: 2a). In the lateral aspect, most crowns show a characteristic bulge

of the anterior side (Fig. 2: 1, 3). Occlusal dentine fields notably communicate but tend to be more subdivided with wear. Anteroconid elements are broadly confluent; the fusion of anterior cap and T5 is wider than that of T4–T5. Insular reentrant (BRA3) is deep and usually clearly curving anteriorly. Occasionally, its depth can be partly reduced by the formation of normally a very short-living enamel islet. Sometimes BRA3 becomes more shallow without distinct insulation but with a formation of a clear “shelf” homologous to enamel islet. The tip of BSA3 is blunt in most studied specimens. Sometimes it bears a poorly expressed groove (Fig. 1: 1), and only in juvenile specimens can it bear a deeper groove (Fig. 10: 1). The shape of anterior cap is from rounded to rectangular. Clear signs of the second complication of the anterior cap are not manifested.

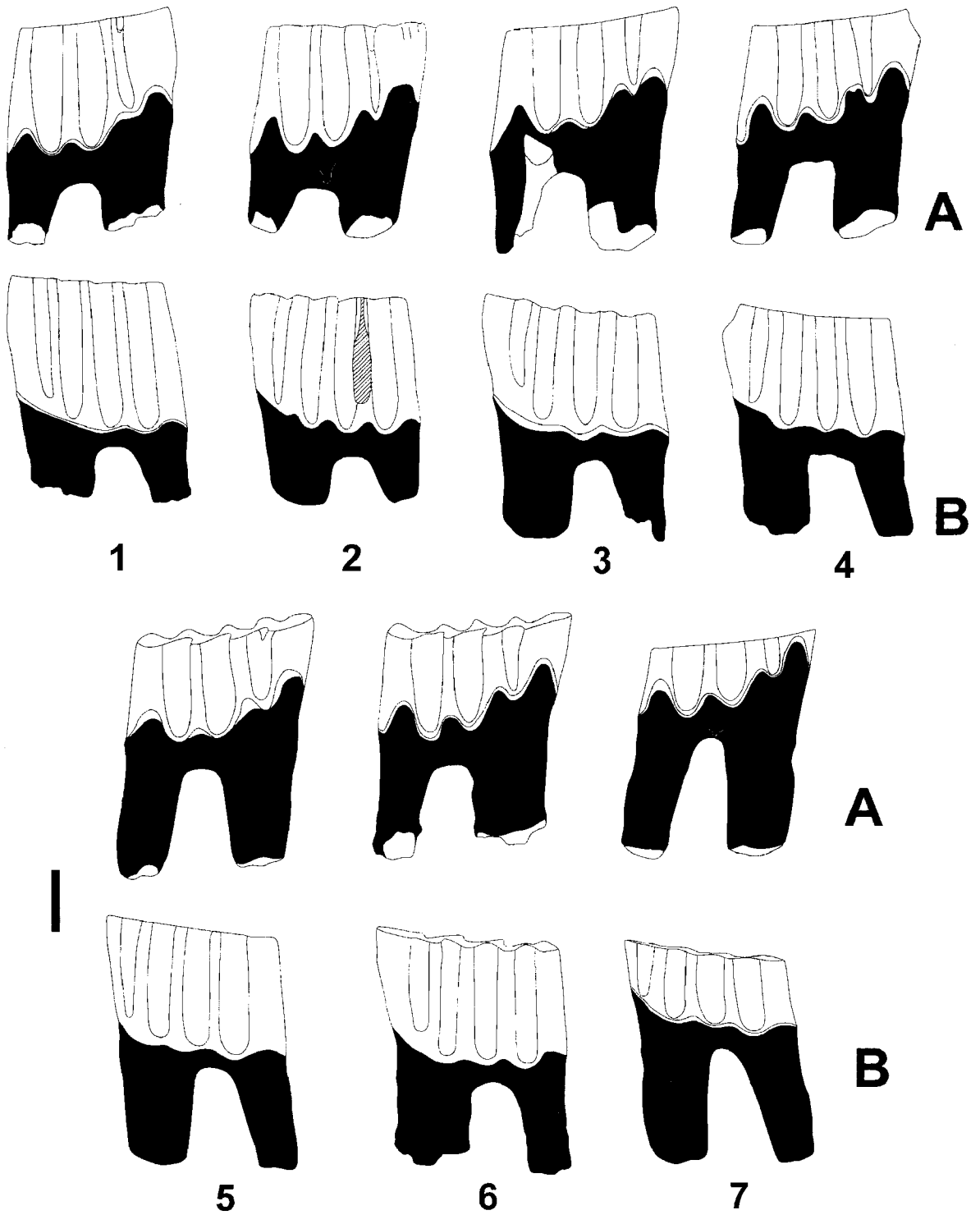


Figure 2. *Pliomys destinatus* sp. nov., m1, 1–7: lateral view, a: labial side, b: lingual side. 1. 20/8: paratype, 2. 20/2, 3. 3825-04, 4. 20/12, 5. 3825-01: holotype, 6. 20/11, 7. 20/4. 4, 6: reversed. Scale bar 1 mm.

Table 2. Measurements and indices of *Pliomys destinatus* sp. nov., m2, Odessa Catacombs.

	n	Mean	Minimum	Maximum	Std.Dev.	Std. error	CV
LENGTH	14	1.72	1.55	1.90	0.0820	0.0219	4.77
WIDTH	17	1.06	0.90	1.22	0.0914	0.0222	8.60
ASD	13	0.60	0.45	0.80	0.1030	0.0286	17.06
HSD	14	0.31	0.25	0.40	0.0413	0.0110	13.13
HSLD	15	0.26	0.15	0.35	0.0573	0.0148	21.93
HH-INDEX	14	0.41	0.29	0.50	0.0586	0.0157	14.19
Σ _tract	12	1.16	0.95	1.45	0.1661	0.0479	14.27

Anteroconid triangles (T4–T5) are distinctly separated by proevergent LRA3 with not more than 1–1.5 widths of enamel left in the dentine communication between them. The sinuous line at the enamel-dentine juncture (EDJ) is wavy with tips of anterosinuid (at the labial side of anterior cap), “mimosinuid” (BSA3), hyposinuid (BSA1), and hyposinulid (LSA1) forming the highest tracts. The EDJ on the posterior loop is commonly

higher than lower edge of the adjacent lingual and labial reentrants (Fig. 2: 6).

m2 (Tab. 2, Fig. 3). Two roots. The posterior root is positioned upon the dorsal surface of the incisor and has a fork-like shape (full acrorhizal condition). No signs of a pleurorhizal shift trough the ontogeny are observed. The highest tracts are anterosinuid, hyposinuid, and hyposinulid. The ASD is complicated by

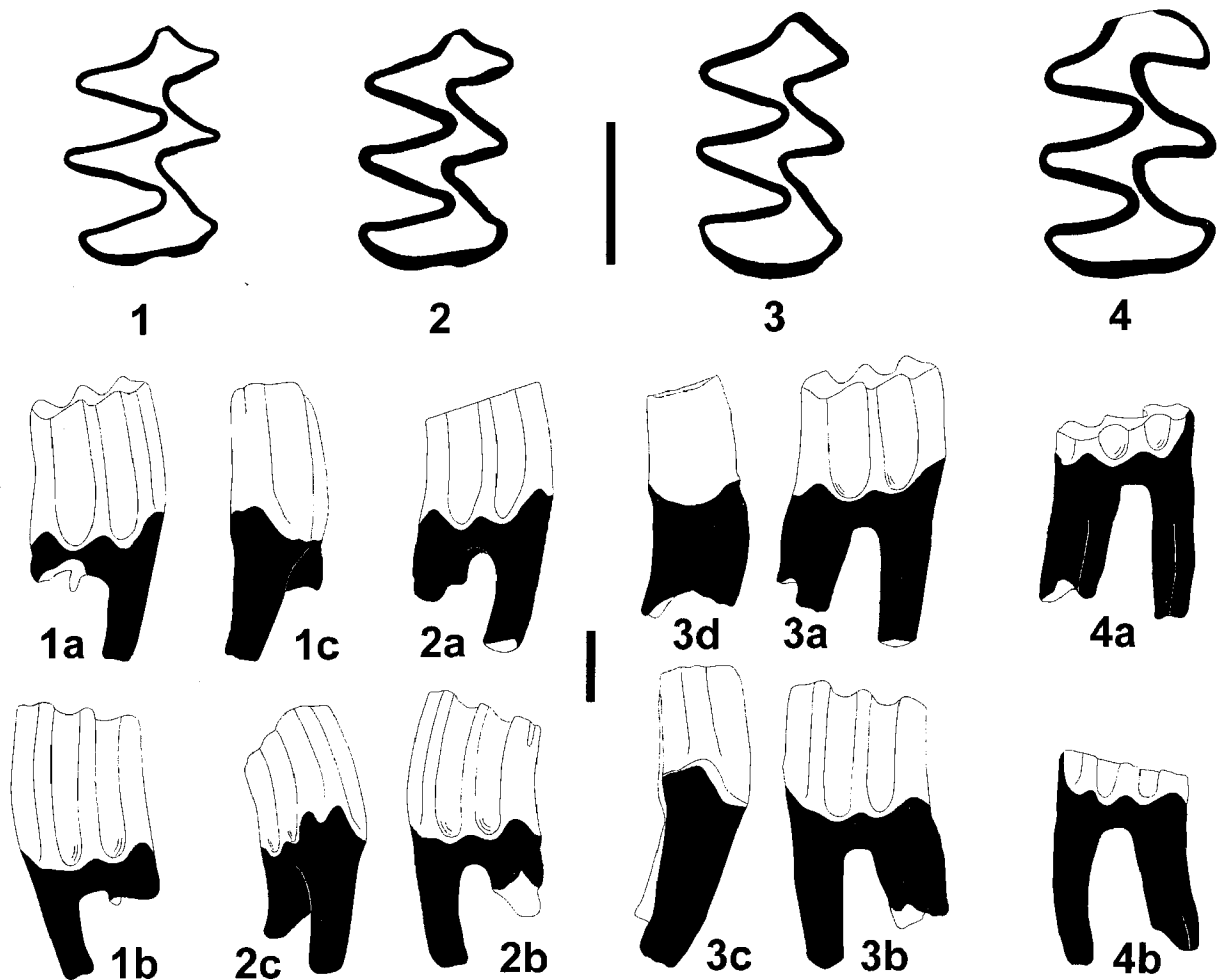


Figure 3. *Pliomys destinatus* sp. nov., m2, 1–4: occlusal surface, a: labial side, b: lingual side, c: anterior side, d: posterior side. 1. 20/27, 2. 20/19, 3. 3825-01: holotype, 4. 20/22. 2: reversed. Scale bar 1 mm.

Table 3. Measurements and indici of *Pliomys destinatus* sp. nov., m3, Odessa Catacombs.

	n	Mean	Minimum	Maximum	Std.Dev.	Std. error	CV
LENGTH	14	1.45	1.20	1.55	0.1075	0.0287	7.42
WIDTH	17	0.80	0.65	0.90	0.0766	0.0186	9.54
ASD	13	0.55	0.45	0.85	0.1030	0.0286	18.60
HSD	13	0.13	0.05	0.20	0.0541	0.0150	41.04
HSLD	14	0.10	0.01	0.20	0.0591	0.0158	56.63
HH-INDEX	13	0.17	0.07	0.28	0.0642	0.0178	37.19
Σ _tract	12	0.80	0.54	1.00	0.1200	0.0346	14.96

a variably expressed tract of the adjacent BSA3 thus acquiring a doubled tip (Fig. 3: 1c, 2c).

m3 (Tab. 3, Fig. 4). Two roots. Younger molars have deep antero-lingual reentrant (LRA3) close to the right angle. At later wear stages it becomes shallower

and represents a blunt angle. Pairs of occlusal triangles, T1 and T2, and T3 and T4 are broadly confluent.

Cranial morphology. A fragment of maxillary bone with preserved left M1, alveoli of the right M1, and anterior walls of double-rooted alveoli of both M2,

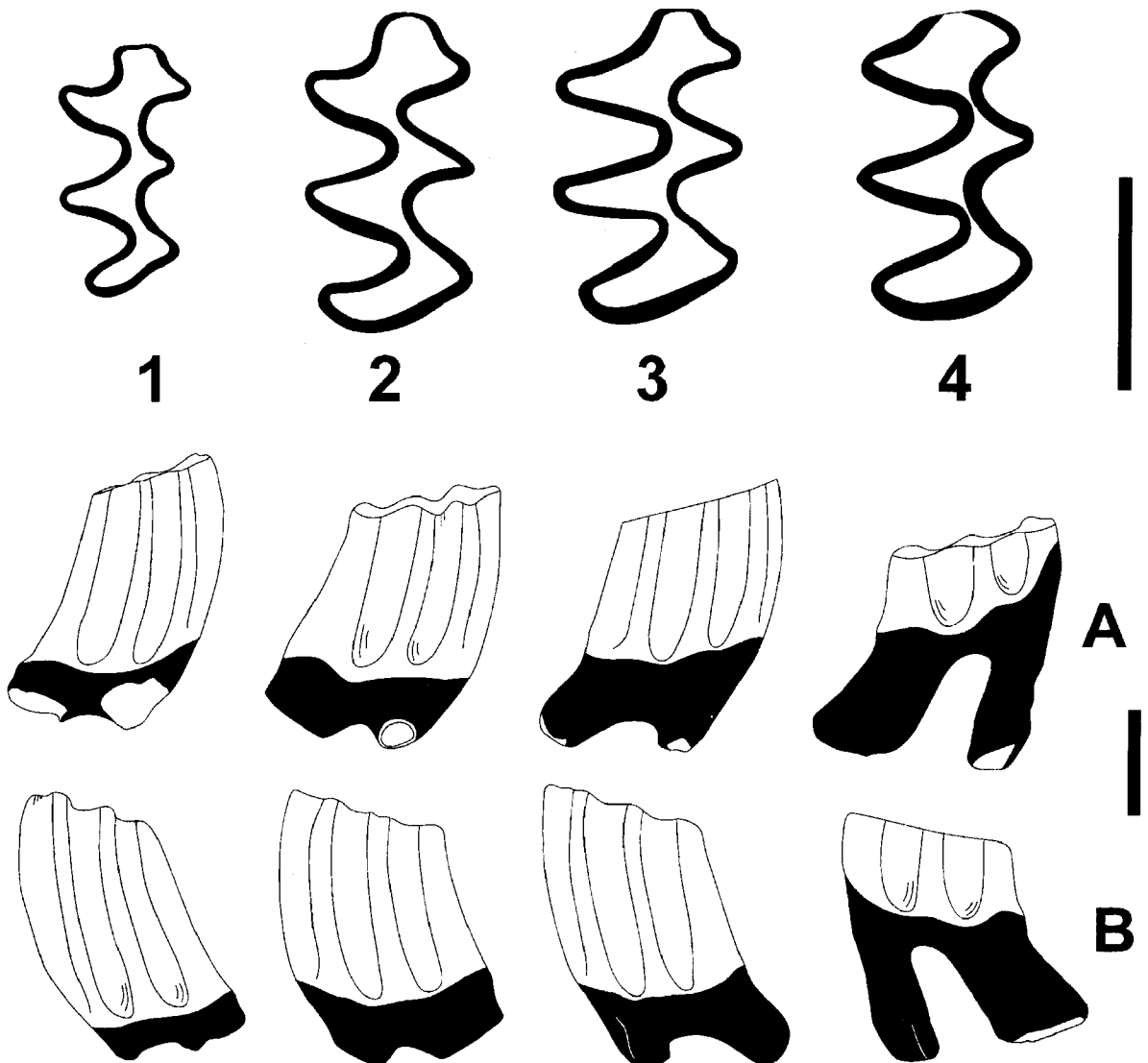


Figure 4. *Pliomys destinatus* sp. nov., m3, 1–4: occlusal surface, a: labial side, b: lingual side. 1. 20/45, 2. 20/37, 3. 20/38, 4. 20/40. 3, 4: reversed. Scale bar 1 mm.

Table 4. Measurements and indici of *Pliomys destinatus* sp. nov., M1, Odessa Catacombs.

	n	Mean	Minimum	Maximum	Std.Dev.	Std. error	CV
LENGTH	20	2.32	2.10	2.57	0.1330	0.0297	5.74
WIDTH	27	1.29	1.10	1.50	0.1047	0.0201	8.09
DS	23	0.52	0.35	0.70	0.0903	0.0188	17.23
AS	21	0.23	0.15	0.35	0.0564	0.0123	24.09
ASL	20	0.20	0.05	0.35	0.0724	0.0162	37.11
PRS	22	0.47	0.35	0.60	0.0882	0.0188	18.86
PA-INDEX	19	0.53	0.38	0.65	0.0942	0.0216	17.94
Σ _tract	17	1.41	1.10	1.75	0.1699	0.0412	12.03

Table 5. Measurements and indici of *Pliomys destinatus* sp. nov., M2, Odessa Catacombs.

	n	Mean	Minimum	Maximum	Std.Dev.	Std. error	CV
LENGTH	9	1.92	1.75	2.05	0.0880	0.0293	4.58
WIDTH	19	1.18	1.00	1.35	0.0973	0.0223	8.21
DS	10	0.37	0.25	0.50	0.0818	0.0259	22.42
AS	17	0.27	0.17	0.40	0.0627	0.0152	23.24
ASL	16	0.28	0.17	0.35	0.0448	0.0112	16.03
PA-INDEX	16	0.39	0.28	0.53	0.0619	0.0155	15.98
Σ _tract	9	0.87	0.74	1.05	0.1149	0.0383	13.16

Table 6. Measurements and indices of *Pliomys destinatus* sp. nov., M3, Odessa Catacombs.

	n	Mean	Minimum	Maximum	Std.Dev.	Std. error	CV
LENGTH	15	1.63	1.42	1.85	0.1140	0.0294	7.00
WIDTH	18	0.96	0.80	1.15	0.0865	0.0204	8.98
DS	15	0.26	0.15	0.35	0.0651	0.0168	25.36
AS	17	0.22	0.12	0.35	0.0642	0.0156	28.59
ASL_H	17	0.20	0.10	0.25	0.0534	0.0129	26.49
PA_INDEX	17	0.31	0.19	0.39	0.0610	0.0148	19.88
LP/L	15	42.16	31.25	51.61	5.7621	1.4878	13.67
Σ _tract	15	0.69	0.50	0.83	0.1127	0.0291	16.42

GIN EMM-20/69 (Fig. 11). The projective distance between posterior edge of incisor foramens and anterior edge of M1 is more than 0.2 mm. The anterior edge of maxillo-palatine suture bears two indentations and projects as far as to the anterior part of hypocone and the posterior root of M1. The distance between alveoli of protocone roots of M1 is 2.8 mm. The postero-palatine region is not preserved. In anterior view this specimen shows distal walls of incisor alveoli tightly contacting anterior roots of M1.

M1 (Tab. 4, Fig. 5). All studied molars have three roots. LRA1 is typically non-vergent so that the anterior wall of T1 (protocone) often runs parallel to the opposing anterior wall of BRA1. LRA3 approaching the right angle in younger individuals.

M2 (Tab. 5, Fig. 6). All molars in the collection have three roots. The anterior prism has distinctly triangular form. The shallow additional reentrant at the anterior face of the prism tend to excavate with wear.

M3 (Tab. 6, Fig. 7). Two-rooted specimens (n=13, 81%), though sometimes with flattened transversely ovoid anterior root, are predominant over rare tree-rooted teeth (n=3, 19%) with the bipartite anterior root. A strongly reduced lingual rootlet may occur (n=2) below LRA2 (Fig. 7: 6). The anterior enamel islet is closed early in the ontogeny, it is shallow and short-lived in most specimens and its obliteration leads to the broad confluence of anterior cap and T2. The posterior enamel islet is irregularly present (Fig. 7: 3) and may be closed in some molars during older wear stages. T2 and

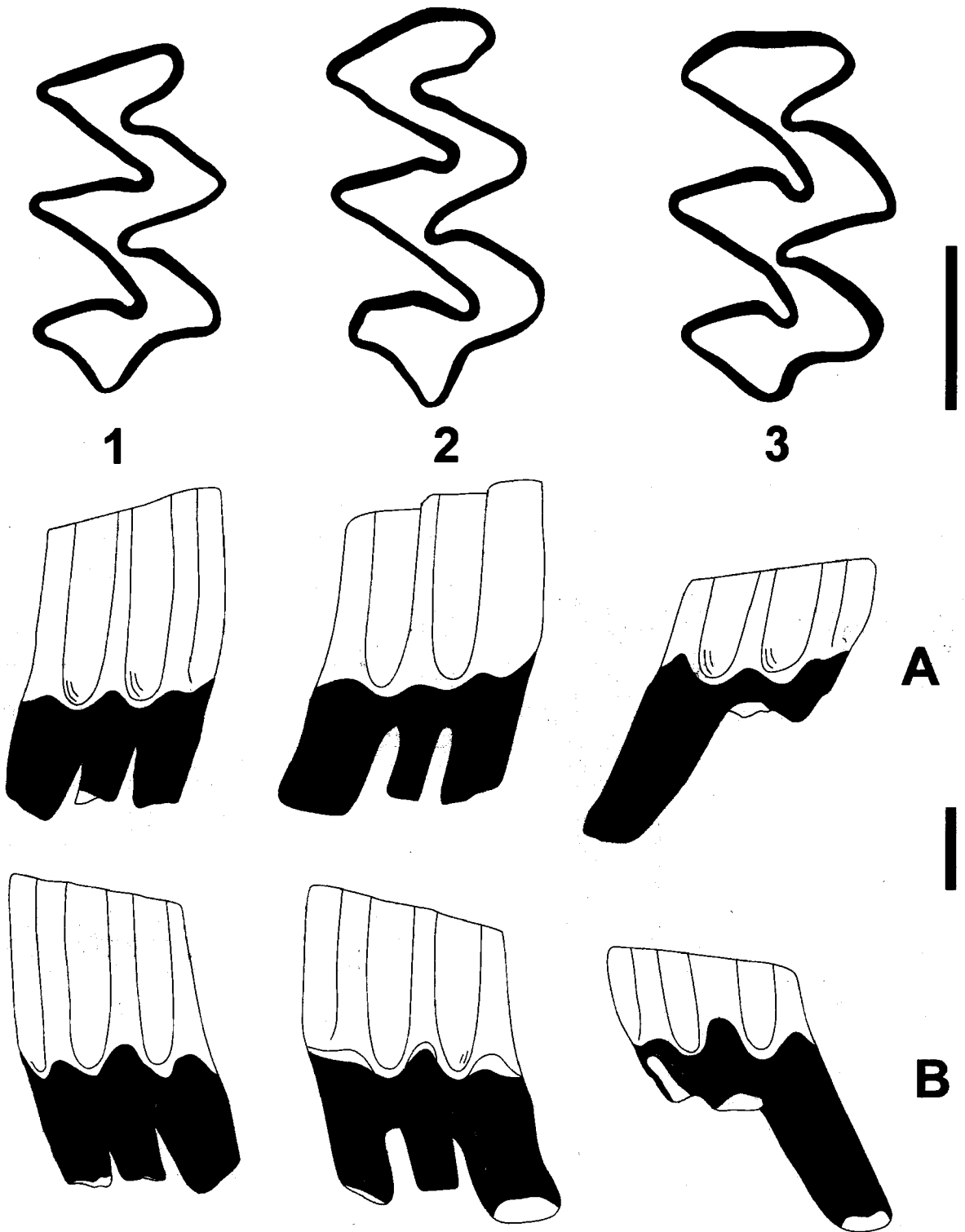


Figure 5. *Pliomys destinatus* sp. nov., M1, 1–3: occlusal surface, a: labial side, b: lingual side. 1. 20/73, 2. 20/72, 3. 20/81. 2: reversed. Scale bar 1 mm.

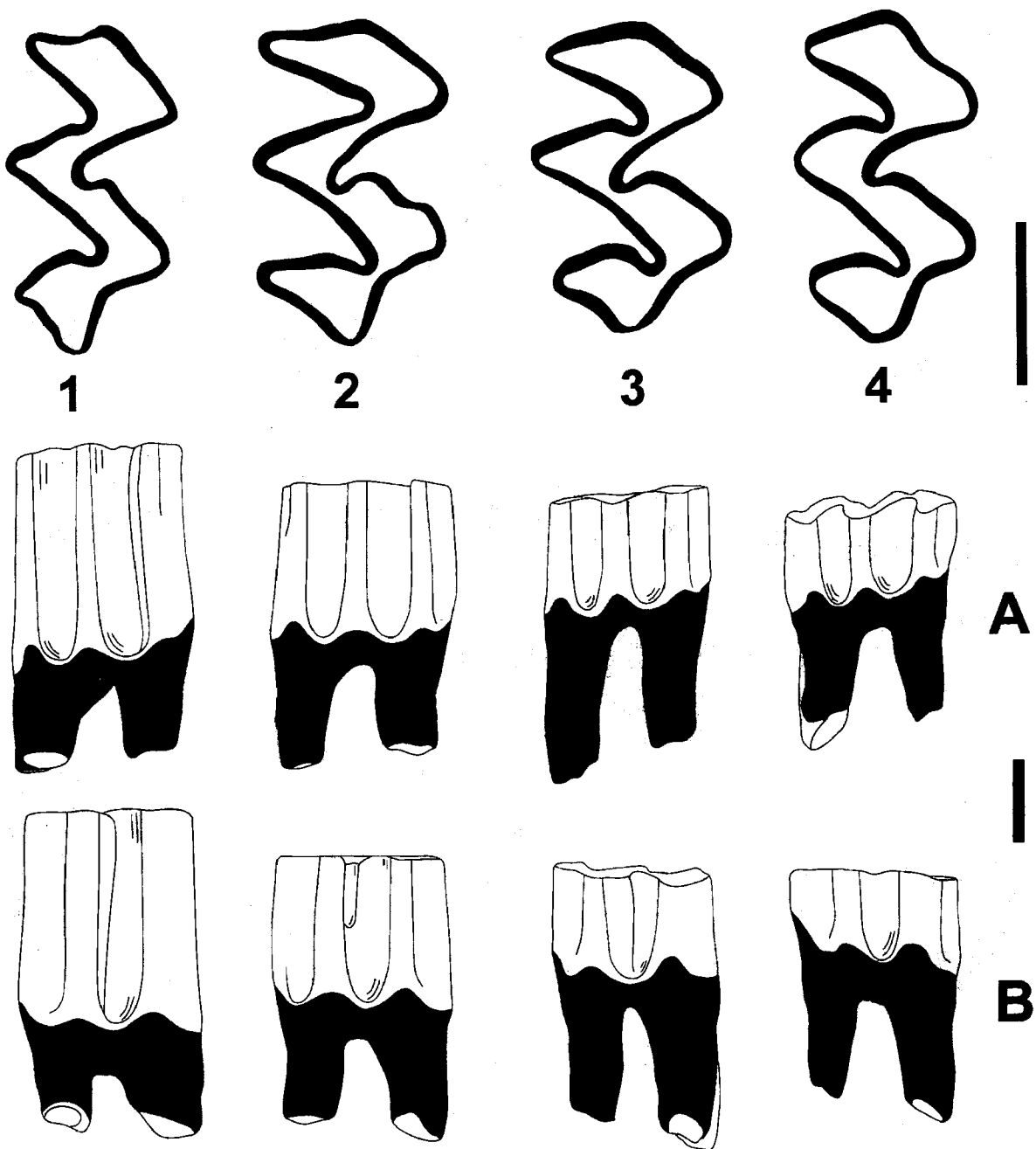


Figure 6. *Pliomys destinatus* sp. nov., M2, 1–4: occlusal surface, a: labial side, b: lingual side. 1. 20/113, 2. 20/96, 3. 20/97, 4. 20/109. Scale bar 1 mm.

T3 are clearly separated by the tip (often curving) of LRA2. The posterior loop, with usually small T4, fuses with T3 at the labial side (Fig. 7: 2) or, much more typically, at the lingual side thus strongly reducing the communication with T3 (Fig. 7: 4).

Comparison. *Pliomys kowalskii* from Moskovei (Schevtschenko, 1965). The Odessa form differs from this late Ruscinian vole from Moldova in more reduced Mimomys-ridge, more advanced hypsodonty stage.

Pliomys moldavicus and *Pliomys kowalskii* from Etulia (Shushpanov, 1985) represent the single variable form of *Pliomys* close to the type *P. kowalskii*. This species shows strongly developed mimomyian ridge and BRA3 frequently insulated with wear. M3 show well developed posterior and anterior enamel islets. The Odessa *Pliomys* is clearly more advanced in higher hypsodonty, more reduced mimomyian features, including less frequent and more short-living enamel islets in m1 and M3.

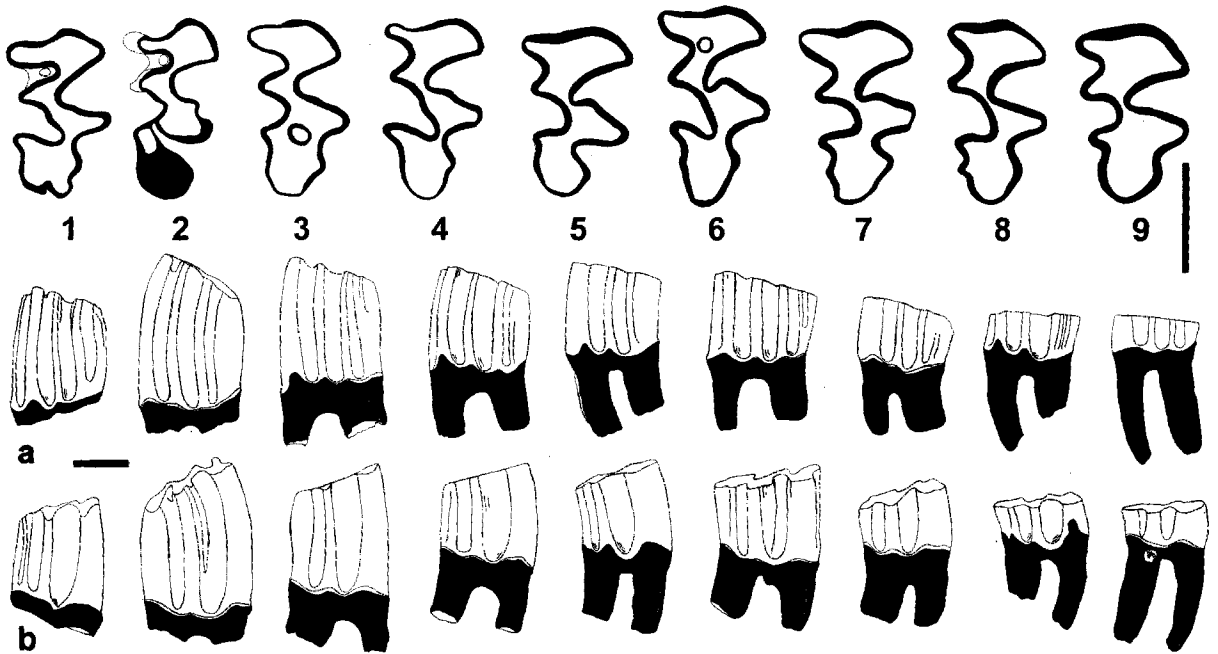


Figure 7. *Pliomys destinatus* sp. nov., M3, 1–9: occlusal surface, a: labial side, b: lingual side. 1. 20/65, 2. 20/68, 3. 20/64, 4. 20/51, 5. 20/59, 6. 20/52, 7. 20/66, 8. 20/53, 9. 20/67. 1, 6–9: reversed. Scale bar 1 mm.

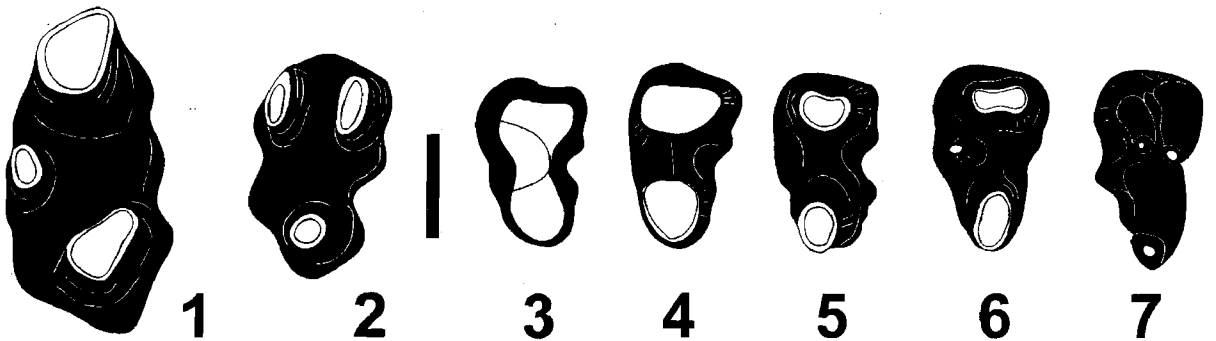


Figure 8. *Pliomys destinatus* sp. nov., upper molars, root view. 1. M1, 20/72, 2. M2, 20/109, 3–7: M3, 3. 20/65, 4. 20/68, 5. 20/51, 6. 20/52, 7. 20/67. 1, 6, 7: reversed. Scale bar 1 mm.

Dolomys hungaricus from Csarnota 2 (Kormos, 1934; Kretzoi, 1959). The Hungarian vole is distinct from the Odessa *Pliomys* in larger size (on the average above 3.0 mm), more complex structure of the anteroconid cap with distinct salient folds of the second complication in younger individuals, more vergent reentrants, more asymmetrical occlusal pattern of lower molars with enlarged lingual triangles, stronger reduction of mimomyan ridge and its morphological indicators, and in higher frequency of posterior enamel islets and three-rooted specimens of M3.

Dolomys ucrainicus Topachevsky & Scorik, 1967. This advanced *Pliomys* species originates from the Chervichnoe locality of late Early Villanyian age (MN16b). The Odessa *Pliomys* is smaller, much less hypsodont, has less complex m1, which preserve remnants of mi-

momyiod morphology. However, *Pliomys destinatus* sp. nov. resembles *P. ucrainicus* in the overall dental morphology, especially conspicuous in juvenile and young specimens.

Pliomys graecus Bruijn & Meulen, 1975 from Tourkobunia (MN16). This advanced *Pliomys* co-occurs with primitive cemented *Mimomys*. This species has m1 of arvaloid complexity stage, and it is indistinguishable from *Pliomys ucrainicus*. The new Odessa form is much less advanced both in hypsodonty and dental complexity than the Greek *Pliomys*.

Pliomys jalpugensis Nesin, 1983. This primitive species of *Pliomys* was analytically separated from the co-occurring *Pliomys ucrainicus* in the taphonomically mixed (see Tesakov, 2004) locality Kotlovina 2 in southern Ukraine (Nesin, 1983, Topachevsky & Nesin,

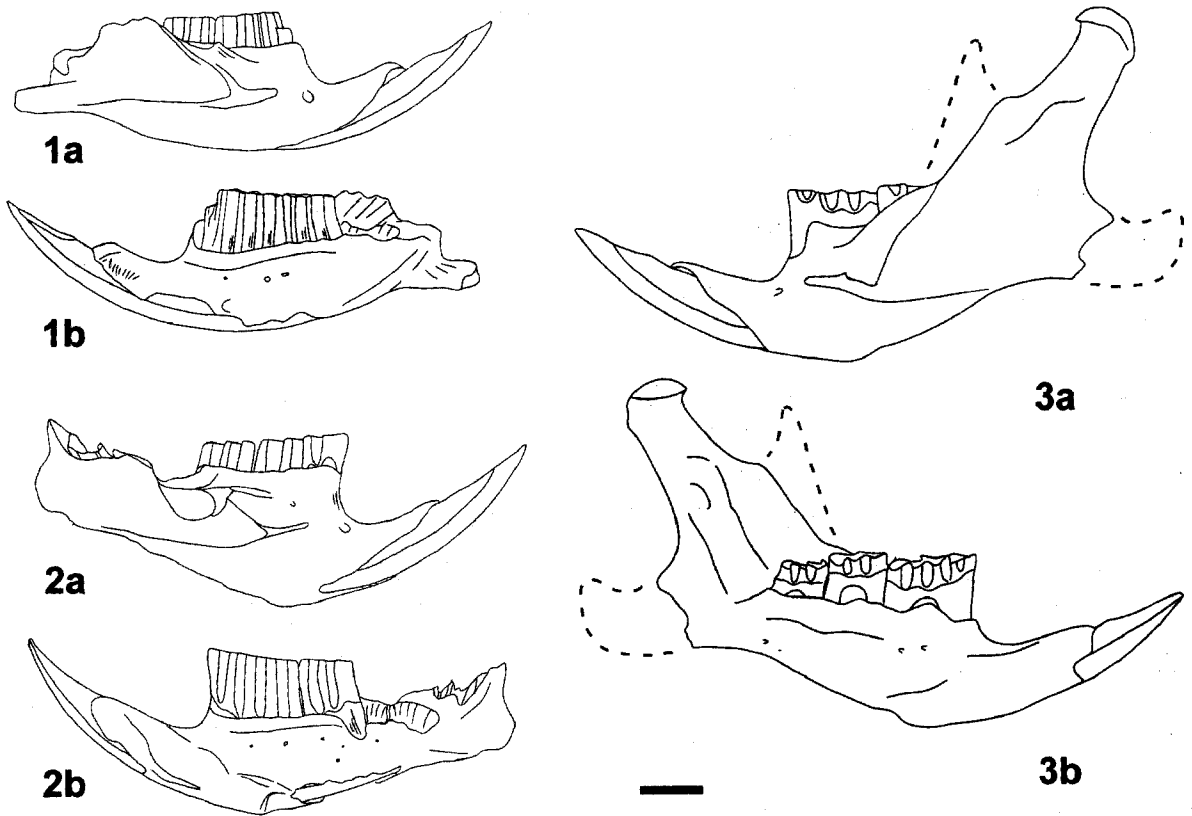


Figure 9. *Pliomys destinatus* sp. nov., fragments of mandibles, 1–3: lateral view, a: labial side, b: lingual side. 1. 3825-03, 2. 3825-01: holotype, 3. 20/14. Scale bar 0.5 mm.

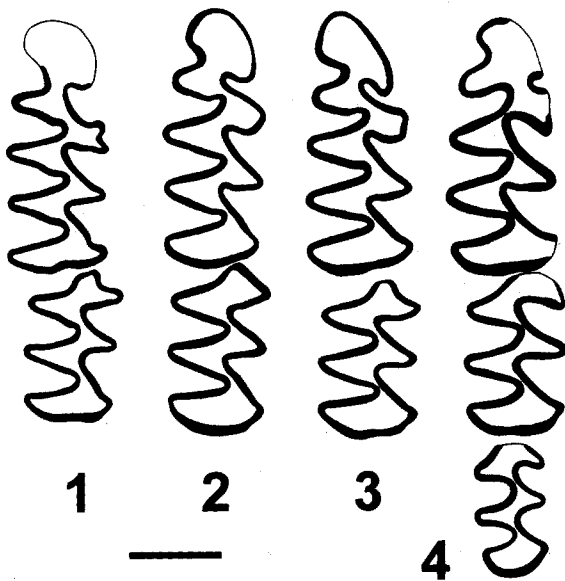


Figure 10. *Pliomys destinatus* sp. nov., mandibular tooth rows, 1–4: occlusal surface. 1. m1–m2, 3825-03, 2. m1–m2, 3825-01: holotype, 3. m1–m2, 3825-02, 4. m1–m3, 20/14. 4: inverted. Scale bar 1 mm.

1989). It possibly represents an earliest Villanyian biochronologic level. The new species is distinct from *P. jalpugensis* in lower degree of hypsodonty, in less reduced *Mimomys* features in m1, in more curving BRA3, and in more rounded anterior cap of anteroconid. Most specimens (see Nesin, 1983, Fig. 1: 1–4) in the described series of M3 of *P. jalpugensis* seem to represent a different, more brachiodont taxon, likely *P. kowalskii*, because the illustrated two-islet morphotypes are absent or extremely rare already at the stage of *P. destinatus* sp. nov. The two specimens of M3 that may actually belong to *P. jalpugensis* were illustrated by Nesin in his Fig. 1: 5 as *P. jalpugensis*, and in Fig. 2: 3 as *P. ucrainicus*.

Dolomys hungaricus from Weże 1 (Sulimski, 1964). This form is actually very similar to the species from Odessa Catacombs both in the stage of hypsodonty and the overall morphology. However, different pattern of dental variability possibly argues against the conspecificity of the two forms. Among distinctive features are notably less vergent reentrants, much simpler anteroconid caps in m1, more triangular anterior cap of M2, higher frequency of two-rooted M3, and generally deeper LRA3 of M3 in the Odessa form.

Promimomys moldavicus/Propliomys from Dranic (Radulescu *et al.*, 1996). A sequence of small prom-

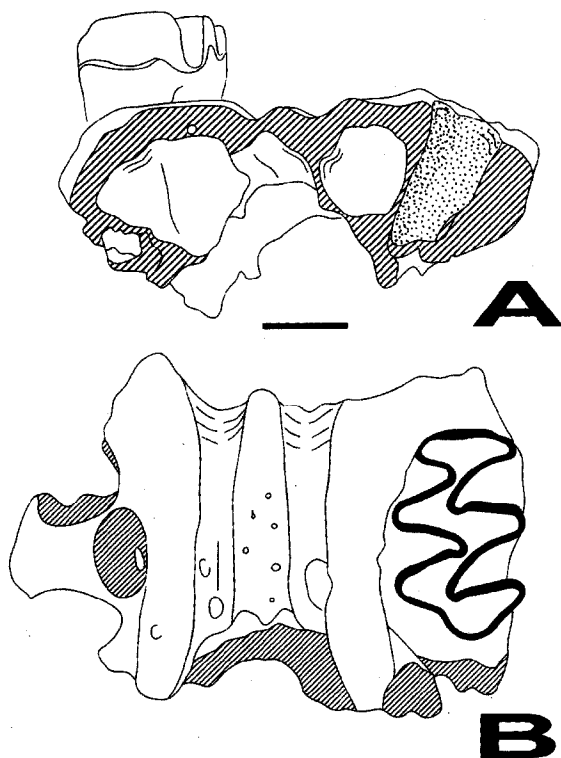


Figure 11. *Pliomys destinatus* sp. nov., fragment of maxillary bone, 20/69. a: anterior view, b: ventral view. Scale bar 1 mm.

imyoid voles from several Late Ruscinian levels of this locality show the transitional morphology resembling *P. kowalskii* in a trend to reduction of enamel islet in m1 by its ontogenetically later insulation. The Odessa *Pliomys* differs from these forms in the same features as from *P. kowalskii* from Moldavian sites.

Propliomys hungaricus from Podari (Radulescu & Samson, 1996). The form from this early Villanyian locality differs from the Odessa *Pliomys* in same features as the type *P. hungaricus*.

Remarks. I.M. Gromov (Gromov & Polyakov, 1977) noted that the vole from Odessa Catacombs was preliminarily studied by M. Kretzoi who had suggested the species name "odessanus" for it. Later, the species *Dolomys odessanus* Nesin, 1987 was described from the Late Ruscinian association of Kotlovina 1 (Nesin, 1987). Although, the *Dolomys* affinities of this poorly known form are quite possible, it cannot be excluded that it is congeneric with the vole from Odessa Catacombs. Therefore, I prefer to introduce a different name to avoid a possible homonymy.

Studies of Late Ruscinian vole associations are complicated by the insufficient degree of morphological divergence between numerous lineages of voles produced by the explosive radiation of mimomyoid voles. Many co-occurring forms of proto-*Mimomys*, *Pliomys*, and *Dolomys* evolutionary groups display a broad morphological overlap hampering isolation of pure dental

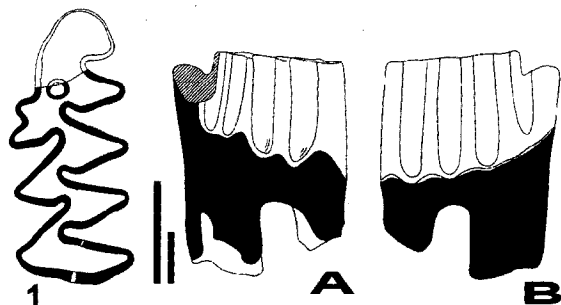


Figure 12. *Promimomys* sp., m1, 3825-05. 1: occlusal surface, a: labial side, b: lingual side. Scale bars 1 mm.

series. The sample of Odessa Catacombs, possibly due to a certain environmental taphonomic filter, presents an exception with only one vole species strongly dominating in the association. Topachevsky & Nesin (1989) noted the presence of *Promimomys moldavicus* along with *Pliomys* in the fauna of the Odessa Catacombs. In my mind, in most cases these authors took for *Promimomys* ontogenetically old specimens of *Pliomys* with enamel islets in m1. The studied materials show signs of a mixture in the sample of more than one species neither in sinumetry nor in occlusal morphology of molars. Noteworthy is the strong predominance of two-rooted M3, another important indication of the *Pliomys* rather than *Promimomys* evolutionary level of the studied vole. However, a very rare presence of *Promimomys* admixture is probably indicated by the specimen OSM-3825/05 (Fig. 12).

Measurements. See Tables 1-6.

Occurrence. The type locality.

Discussion

The *Pliomys* species from Odessa Catacombs represents a very important transitional morphological stage between the Middle-Late Ruscinian array of small promimomyoid forms called *Promimomys moldavicus* and the Early Villanyian *Pliomys* lineage of the Black Sea Region. The main morphological trend within *P. moldavicus* towards *Pliomys* morphology was clearly shown by Radulescu & Samson (1996). As to the particular descending group, I currently favour the phyletic linkage of *P. destinatus* sp. nov. with the lineage of *Pliomys jalpugensis* – *Pliomys ucrainicus* (including *Pliomys graecus*). *Pliomys hungaricus* most probably represents a distinct, though related lineage. An array of nascent forms attributed to *P. hungaricus*, for example, from Weże (Kowalski, 1961, Sulimski, 1964) or Muselievo (Popov, 2004), actually represents more primitive stages, possibly ancestral to *P. hungaricus* or other later *Pliomys* lineages of Villanyian and Biharian age.

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