

Insectivora (Mammalia) from the Early and early Middle Pleistocene of Betfia in Romania. II. Erinaceidae BONAPARTE, 1838 and Talpidae GRAY, 1825

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Received: 10 Feb., 2000

Accepted for publication: 28 March, 2000

RZEBIK-KOWALSKA B. 2000. Insectivora (Mammalia) from the Early and early Middle Pleistocene of Betfia in Romania. II. Erinaceidae BONAPARTE, 1838 and Talpidae GRAY, 1825. Acta zool. cracov., 43(1-2): 55-77.

Abstract. 3 unidentified species of hedgehogs, 3 species of moles and 2 species of water-moles are described from the Early and early Middle Pleistocene of the Betfia Karstic Complex. The systematic position of the above-mentioned taxa, their measurements, illustrations and diagrams are given.

Key-words: fossil mammals, Insectivora, Erinaceidae, Talpidae, Early and early Middle Pleistocene, Romania.

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I. INTRODUCTION

The fissure-filling system of the Betfia Karstic Complex contains very rich vertebrate fauna. It is situated near the city of Oradea in Romania. The fauna of this complex is dated to the Early and early Middle Pleistocene. It was studied by several authors, but mostly by Elena TERZEA from the Speological Institute in Bucarest and recently by HÍR and VENCZEL, who published papers on rodents from Betfia-IX. The detailed information on the fauna of Betfia, its age and biochronology are given by TERZEA (1994, 1995a and b), RZEBIK-KOWALSKA (2000, this volume) and concerning B-IX also by HÍR and VENCZEL (1998 a and b).

Numerous remains of insectivores mammals present in the the Betfia localities have not been studied. The present paper is the second of two concerning Insectivora from the Betfia Karstic Complex and describes the Erinaceidae and Talpidae Table XVIII). The first one deals with the Soricidae.

In the present paper maximal length and width of teeth were taken in the occlusal view [according to the patterns presented by HUTCHISON (1974) and RÜMKE (1985)]. The exception was made for the upper M¹ the buccal length of which has been measured. The highest number of identical elements (e. g. right first lower molar, M₁) has been assumed to be the minimum number of individuals.

Most fossil materials studied in this paper are housed in the collections of the Institute of Speology "Emil RACOVITZA" (ISER) in Bucharest and a large part of the Betfia-IX materials are in the Museum in Oradea (Muzeu Tarii Crisurilor – MTC), Romania.

A c k n o w l e d g e m e n t s. I am particularly grateful to Drs. Elena TERZEA, János HIR and Marton VENCZEL who gave me the Insectivora materials to study. I am indebted to Mr. Marek KAPTURKIEWICZ for the illustrations.

II. SYSTEMATIC PART

Family Erinaceidae BONAPARTE, 1838

Subfamily Erinaceinae BONAPARTE, 1838

Genus *Erinaceus* LINNAEUS, 1758

Erinaceus sp. 1

M a t e r i a l. B-XIII. The material contains isolated upper molars such as 1 M¹ and 2 M² (all damaged) and isolated lower teeth: 2 I₁, 1 C, 1 P₃, 1 P₄, 1 M₂ and 3 M₃. The minimal number of individuals = 3.

D e s c r i p t i o n o f m a t e r i a l. First upper molar M¹, damaged in the paracone, metastyle and its lingual side is subquadrate in occlusal outline and its buccal side is almost straight. It has a small parastyle and a very distinct metaconule. There is no trace of the protoconule in the used ridge joining the paracone and the protocone. The cingulum visible in undamaged parts of the tooth is rather strong. Second upper molar M², less damaged (only in antero-buccal corner) is smaller and trapezoid in shape. Its detailed morphology is similar to the morphology of M¹.

First lower incisor, I₁, is strong. The buccal side of its crown is convex, the lingual one a little concave and provided with a wide but barely protruding cingulum. The root of I₁ is long and strong.

The lower canine, C, is unicuspid. The cusp is situated in the anterior part, more or less in 1/3 of the tooth length. The tip of the cusp is connected with the anterior side of the crown by a sharp ridge. The buccal side of the crown is flat or a little convex, the lingual one is a little concave. The buccal cingulum, which is wider in its posterior part, continues round the postero-buccal corner of the crown and ends by the cusp, situated more or less in the centre of the posterior wall of the tooth. The lingual and postero-lingual cingula are less protruding. The canine has one root situated in the posterior part of the tooth.

The lower premolar, P₃, is similar to the canine, but smaller, its crown shorter (almost round), the lingual and posterior walls of the crown are more concave and the anterior and lingual cingula are weaker.

Lower P₄ is characterized by 3 cusps, the paraconid, protoconid, metaconid and the short talonid. The protoconid is the largest, the metaconid is reduced. The posterior wall of the talonid is turned up, especially in the inner side. There is no clear cingulum in P₄. The very small third root is visible in the buccal side of the tooth.

The second lower molar, M₂, is damaged in its postero-buccal side (the hypoconid is lacking). It can be distinguished from M₁ by its anterior side large and round while in M₁ it is narrower and pointed. The wide and protruding cingulum is visible on the buccal side of this tooth. Its lingual side and the entoconid are devoid of the cingulum.

The third lower molar, M₃, is almost round in its occlusal view. It is devoid of a talonid. As in M₂, the anterior part of its crown is wide and round. The wide and protruding cingulum surrounds the tooth from the buccal and posterior sides.

M e a s u r e m e n t s. See Table I.

S y s t e m a t i c p o s i t i o n. The characters and measurements given above indicate that the teeth from B-XIII represent the medium size hedgehog of the genus *Erinaceus*. All the dimensions cited in the Table I (except the length of the lower canine, which is smaller) lie in the

Table I

Erinaceus sp. 1. Dimensions of upper and lower teeth (in mm)

		Betfia-XIII									
		1	2	3	4	5	6	7	8	9	10
M ²	L	4.39*	—	—	—	—	—	—	—	—	—
	W	4.40	—	—	—	—	—	—	—	—	—
I ₁	L	—	—	—	—	—	—	—	—	—	—
	W	—	2.19	2.04	—	—	—	—	—	—	—
C	L	—	—	—	2.34	—	—	—	—	—	—
	W	—	—	—	1.90	—	—	—	—	—	—
P ₃	L	—	—	—	—	2.02	—	—	—	—	—
	W	—	—	—	—	1.80	—	—	—	—	—
P ₄	L	—	—	—	—	—	3.20	—	—	—	—
	W	—	—	—	—	—	2.20	—	—	—	—
M ₂	L	—	—	—	—	—	—	4.93*	—	—	—
	W	—	—	—	—	—	—	3.16*	—	—	—
M ₃	L	—	—	—	—	—	—	—	2.79	2.55	2.58
	W	—	—	—	—	—	—	—	2.14	1.86	2.11

* – slightly damaged

range of variation of *Erinaceus concolor* MARTIN, 1838 used for comparison. They do not exceed its average dimensions and often are placed near their minimum.

In her paper on Betfia (1973) TERZEA described the remains of *Erinaceus* from B-XIII and included them to *E. cf. samsonowiczi* SULIMSKI, 1959. This hedgehog was described by SULIMSKI from the Early Pliocene (MN15) Polish locality Węże 1. It was also mentioned in Hungary by KRETZOI (1962) in the locality Csarnóta of the same age (MN15) as Węże 1. Its presence in much younger, Early Pleistocene B-XIII, seemed to be surprising.

The direct comparison of *Erinaceus* remains from B-XIII with these of *E. samsonowiczi* from type locality Węże 1 excluded their appurtenance to the last species. Although some dimensions are similar in both forms, others, e.g. those of the lower M₃, turned out to be much larger in *Erinaceus* sp. 1. Besides, in contrast with *Erinaceus* from B-XIII all teeth of *E. samsonowiczi* are more massive, all of them have distinct and protruding cingula, the metaconids in their lower P₄ are poorly developed whereas in B-XIII the teeth and their cingula are more delicate and metaconids in P₄ are quite big.

Other fossil species described by KORMOS (1934) from Beremend in Hungary and dated probably from the Early Pleistocene, *E. lechei*, in comparison to *Erinaceus* from B-XIII is smaller and its teeth (lower P₄ and M₃) are shorter because their paraconids are heavily reduced.

E. ostramosi described by JÁNOSSY (1972) from the Early Pleistocene locality Osztramos 8, also in Hungary, is even smaller and more delicate than *E. lechei*. Its lower M₁ and M₂ are very small but its lower P₄ is longer (in proportion to these molars) than in all other species.

Judging from the size, *E. olgae* YOUNG, 1934 from Locality 1 at Choukoutien (often cited in the European literature) belongs also to smaller forms of *Erinaceus*. In contrast with two-rooted upper I³ from B-XIII its upper I³ has three roots (which is unique among living and fossil species) and its lower P₄ and M₃ are also strongly reduced.

The large species of fossil hedgehogs are represented by *E. carmelitus* BATE, 1932 and *E. sharonis* BATE, 1937 described from the Pleistocene of Palestine, by *E. praeglacialis* BRUNNER, 1934 described from the Early Pleistocene of Windloch near Sackdilling in Germany and by *E. davidi* JAMMOT, 1973 described from the Middle Pleistocene of La fage in France.

According to BATE (1937) the size of both Palestinian hedgehogs is similar to the size of *E. europaeus* but they differ from it by several features, e.g. *E. sharonis* by different morphology of short lower P_4 (the tooth is devoid of the metaconid), and *E. carmelitus* by its lower premolar P_4 longer and lower molar M_3 wider and more stout than in *E. europaeus* LINNAEUS, 1758 and *E. concolor*. These characters are not visible in the teeth of *Erinaceus* from B-XIII.

The teeth of *E. davidi* are similar to teeth of the recent hedgehogs but, according to JAMMOT (1973), they are bigger because *E. davidi* is the biggest species of the genus *Erinaceus*. It is also bigger than *Erinaceus* sp. 1 from B-XIII.

According to BRUNNER (1934) *E. praeglacialis* is characterized by a little larger size than recent *E. europaeus* and the special morphological characters and special position of the upper P^3 . Besides, the metastyles in their upper P^4 and M^2 are elongated.

On the other hand, RABEDER (1972) writes that the dimensions of *E. praeglacialis* are compatible with these of *E. europaeus* and both species differ only in morphology, the position of P^3 and the size of the upper M^3 .

As the upper P^3 and M^3 are lacking in the material from B-XIII and some dimensions of teeth from B-XIII are a little smaller than these cited for *E. praeglacialis* it is difficult to say if they belong to this last species.

Unfortunately, the very limited and damaged hedgehog remains from B-XIII does not permit identification of their specific membership.

Erinaceus sp. 2

M a t e r i a l. B-IX. The material consists of the isolated upper teeth: 2 I^3 , 1 P^4 , 1 M^1 , and 2 M^3 and one fragment of mandible with P_4 and 1 isolated M_3 . The minimal number of individuals = 1. B-VII/1. 1 lower molar M_1 .

D e s c r i p t i o n o f t h e m a t e r i a l. Two upper unicuspid (I^3) present in the material are two-rooted. Their anterior roots are narrower. The cusps are high and are situated closer to the anterior than the posterior side. The anterior side of each tooth is wide and convex, the posterior being concave on both buccal and lingual sides. In each tooth the tip of the cusp is connected with the posterior margin of the crown by a sharp ridge. This ridge ends by a distinct cingular cusp. The large, more or less protruding cingulum surrounds each tooth.

P^4 is characterized by the high protocone and low hypocone. The strong cingulum is visible in the posterior side of the tooth, buccal and anterior cingula are weak and the lingual one is lacking. The parastyle is also lacking.

The first upper molar, M^1 , is similar to this described in *Erinaceus* sp. 1 from B-XIII, but it is smaller and more delicate.

Upper M^3 is oval. Its lingual side is wider than the buccal one and the lingual cusp is higher than the buccal one. The cusps are joined by a high ridge. The anterior cingulum is very distinct, the posterior one much less protruding. There is no cingulum in the lingual side of the tooth. Two roots of M^3 are joined in 1/3 of their length, near the crown.

There are only two lower teeth in the material of B-IX and one in B-VII/1. The first one is P_4 put in the small part of mandible, which is damaged on its lingual side. The tooth does not differ from the P_4 from B-XIII, but is smaller and devoid of the third minuscule root under the crown.

The first lower molar, M_1 , is massive and its cusps are stout. The paraconid is well developed and the protoconid and metaconid are separated by the deep valley. The buccal cingulum is

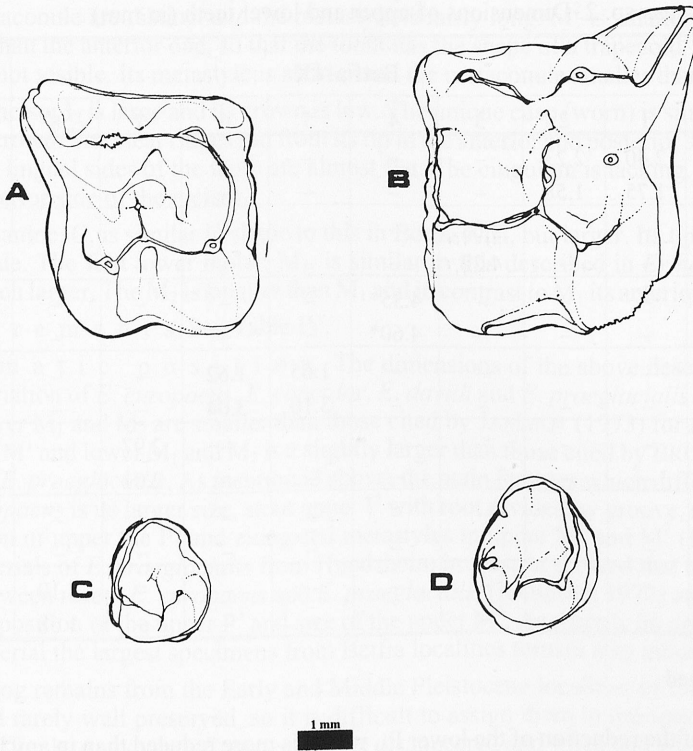


Fig. 1. Differences in size of M^1 in: A – *Erinaceus* sp. 2 from B-IX (spec. no. 4, MTC) and B – *Erinaceus* sp. 3 from B-V (spec. no. 1, ISER) and of M_3 in: C – *Erinaceus* sp. 2 from B-IX (spec. no. 8, MTC) and D – *Erinaceus* sp. 1 from B-XIII (spec. no. 8, ISER).

conspicuous and continues to the posterior wall of the tooth running to the hypoconid/entoconid junction.

The third lower molar, M_3 , is also similar to the M_3 from B-XIII, but it is smaller and the outline of its crown in the occlusal view seems to be a little elongated (not round).

M e a s u r e m e n t s. See Table II.

S y s t e m a t i c p o s i t i o n. By the dimensions the hedgehog from B-IX and B-VII/1 described above stand close to the small species of *Erinaceus* such as *E. samsonowicz*, *E. lechei*, *E. ostramosi* or *E. olgae*. However, although the upper I^3 of *Erinaceus* from B-IX is two-rooted as in *E. samsonowicz* (in all fossil and living European species this tooth, if known, has only one root with the exception of I^3 in *E. olgae*, which is three-rooted) its teeth are a little smaller and more delicate, their cingula less protruding and its lower P_4 and M_3 less reduced than in *E. samsonowicz* (SULIMSKI 1959, 1962).

As concerns *E. lechei* its size seems to be comparable with the size of *Erinaceus* from B-IX and B-VII/1, but according to KORMOS (1934) the paraconids in lower P_4 and M_3 are strongly reduced in *E. lechei* and these differ from specimens in B-IX.

Table II

Erinaceus sp. 2. Dimensions of upper and lower teeth (in mm)

		Betfia-IX								Betfia-VII/1
		1	2	3	4	5	6	7	8	9
I ³	L	2.40	2.23	—	—	—	—	—	—	—
	W	1.75	1.58	—	—	—	—	—	—	—
P ⁴	L	—	—	3.08	—	—	—	—	—	—
	W	—	—	4.27	—	—	—	—	—	—
M ¹	L	—	—	—	4.35*	—	—	—	—	—
	W	—	—	—	4.60*	—	—	—	—	—
M ³	L	—	—	—	—	1.65	1.62	—	—	—
	W	—	—	—	—	3.10	3.04	—	—	—
P ₄	L	—	—	—	—	—	—	2.97	—	—
	W	—	—	—	—	—	—	2.01	—	—
M ₁	L	—	—	—	—	—	—	—	—	5.18
	W	—	—	—	—	—	—	—	—	3.44
M ₃	L	—	—	—	—	—	—	—	2.10	—
	W	—	—	—	—	—	—	—	1.68	—

* — slightly damaged

The degree of the reduction of the lower P₄, which is more reduced than in any living species in Asia and Europe and the number of roots in the upper I³, which equals three, differ B-IX *Erinaceus* from *E. olgae* (YOUNG 1934).

As mentioned above (p. 57) *E. ostramosi* differs from other species of *Erinaceus* by proportionally short first and second lower molars in relation to a long lower P₄. Although the size of both forms is similar, unfortunately there are no lower molars M₁ and M₂ in the material from B-IX. More material is needed to explain the systematic membership of B-IX and B-VII/1 hedgehogs.

Erinaceus sp. 3

M a t e r i a l. The list of the material is given in Table III. It contains isolated upper (M¹, M²) and lower (I₂, C, M₁, M₂) teeth and their fragments (upper P⁴, lower C, and M₁ or M₂).

The two teeth from B-VII/4 are too fragmentary to be mesured.

Table III

Erinaceus sp. 3

Localities	Number of fragmentary maxillae and detached upper teeth	Number of fragmentary mandible and detached lower teeth	Total	Minimum number of individuals
Betfia-V	3	5	8	2
Betfia-VII/3	0	2	2	1
Betfia-VII/4	1	2	2	1

Description of material. The big upper M^1 does not differ from first upper molar of *E. concolor* or *E. europaeus*. It is subquadrate in occlusal view, its parastyle, protoconule and metaconule are distinct and the metastyle is fairly long. M^2 is smaller and its posterior side is shorter than the anterior one, so that the tooth has the shape of a trapezoid. As it is worn, its protoconule is not visible. Its metastyle is shorter and the metaconule smaller than in M^1 .

The lower incisor I_2 is large and its crown is low. The unique cusp (worn) is situated in the anterior part of the crown. The clear ridges run from its tip in the anterior and posterior sides of the tooth. The buccal and lingual sides of the tooth are almost flat. The cingulum is lacking. One root is situated in the posterior side of the incisor.

The lower canine, C, is similar in shape to this in Betfia XIII, but larger. Its tip in unworn teeth are curved inside. The first lower molar, M_1 , is similar to this described in *Erinaceus* sp. 2 from B-VII/1 but much larger. The M_2 is smaller than M_1 and in contrast to M_1 its anterior side is blunt.

Measurements. See Table IV.

Systematic position. The dimensions of the above described teeth lie in the range of variation of *E. europaeus*, *E. concolor*, *E. davidi* and *E. praeglacialis* although dimensions of the lower M_1 and M_2 are smaller than those cited by JAMMOT (1973) for *E. davidi* and the length of upper M^1 and lower M_1 and M_2 is a slightly larger than those cited by BRUNNER (1934) for the holotype of *E. praeglacialis*. As mentioned above, the main features which differ *E. praeglacialis* from *E. europaeus* is its larger size, stout upper I^3 with root divided by groove, special morphology and position of upper the P^3 and elongated metastyles in upper M^1 and M^2 (BRUNNER 1934). Numerous materials of *E. praeglacialis* from Hundsheim in Austria showed that there is no difference in size between recent *E. europaeus* and *E. praeglacialis* (RABEDER 1972) and two forms differ only by the position of the upper P^3 and size of the upper M^3 . As there is no upper P^3 and M^3 in the studied material the largest specimens from Betfia localities remain also unidentified.

The hedgehog remains from the Early and Middle Pleistocene localities of Europe are usually very scarce and rarely well preserved, so it is difficult to assign them to the species level. In this situation it is difficult to say when *E. praeglacialis* disappeared and when and where *E. europaeus* and *E. concolor* appeared for the first time in Europe. It is also difficult to say if *E. praeglacialis* was the ancestor of recent European species (one or both of them ?). Some authors (e.g. PASA 1947,

Table IV

Erinaceus sp. 3. Dimensions of upper and lower teeth (in mm)

		Betfia-V								Betfia-VII/3
		1	2	3	4	5	6	7	8	9
M^1	L	5.30	—	—	—	—	—	—	—	—
	W	5.86*	—	—	—	—	—	—	—	—
M^2	L	—	4.73	—	—	—	—	—	—	—
	W	—	5.10*	—	—	—	—	—	—	—
I_2	L	—	—	—	—	—	—	—	—	2.69
	W	—	—	—	—	—	—	—	—	2.15
C	L	—	—	3.11*	3.18	3.04	—	—	—	—
	W	—	—	2.17	2.21	2.05	—	—	—	—
M_1	L	—	—	—	—	—	5.96	—	—	—
	W	—	—	—	—	—	3.58*	—	—	—
M_2	L	—	—	—	—	—	—	5.30	5.52	—
	W	—	—	—	—	—	—	3.28	3.36	—

* — slightly damaged

MUSIL 1968) mentioned the presence of *E. europaeus* as early as the late Early and Middle Pleistocene (Soave in Italy, Stránská Skála in the Czech Republic). At that time *E. praeglacialis* is often cited in localities of Europe (BRUNNER 1934, HELLER 1956, FEJFAR 1969). There is practically no data in the fossil materials on remains of the second European species, *E. concolor*, living today in Romania. Before the work of KRÁL (1967), who distinguished it as a new species, in many places (also in fossil localities) *E. concolor* was probably confused with *E. europaeus*. More materials are needed to explain the history and origin of the European hedgehogs.

Family Talpidae GRAY, 1825

Subfamily Talpinae, GRAY, 1825

Genus *Talpa* LINNAEUS, 1758

Talpa minor FREUDENBERG, 1914

M a t e r i a l. The list of the material is given in Table V. It contains mostly isolated upper and lower teeth (with the exception of incisors and lower canine), few remains of mandibles (only one with coronoid process), and numerous humeri.

D e s c r i p t i o n o f m a t e r i a l a n d c o m p a r i s o n w i t h o t h e r E u r o p e a n p o p u l a t i o n s. The remains from the Betfia localities cited above are small in size. The first upper molar M^1 is long in relation to its width, while the second upper molar M^2 is a little wider than long.

The mandible is delicate, the rounded tip of the coronoid process turned backwards, two mental foramina are situated under P_2 and M_1 . Among four lower premolars the second one, P_2 , is the smallest. The P_3 and in some specimens P_2 are placed obliquely in relation to the long axis of the mandible. In the first lower molar M_1 the triangle of the trigonid is smaller than the triangle of the talonid while in the second and third molars, M_2 and M_3 , the triangles of the trigonids are bigger. In the lingual side of M_1 four cusps are visible because besides the paraconid, metaconid and entocoid the entostylid is present. The M_2 is characterized by five or six cusps because it has two or three additional ones, the parastylid, the entostylid and split (double) entoconid. The M_3 has, as M_1 , only four cusps, but the additional cusp is the anterior parastylid.

In general the dental morphology of specimens described above does not differ from that in the recent mole, *T. europaea*. The same goes for the morphology of the humerus. The detailed description of the morphology of *T. minor* as well as its synonymy can be found in RABEDER (1972).

The remains from five Betfia localities differ in size and morphology neither between them nor from other European population, except of those from Hundsheim which seem to be slightly larger (RABEDER 1972).

Table V

Talpa minor FREUDENBERG, 1914

Localities	Number of fragmentary maxillae and detached upper teeth	Number of fragmentary mandibles and detached lower teeth	Number of humeri	Total	Minimum number of individuals
Betfia-X	1	3	5	9	3
Betfia-XI	1	5	9	15	5
Betfia-IX	44	67	80	191	48
Betfia-VII/1	2	0	0	2	2
Betfia-VII/3	1	2	0	3	1
Betfia-XII	0	0	4	4	3

M e a s u r e m e n t s. See Tables VI-VIII.

Table VI

Talpa minor FREUDENBERG, 1914. Dimensions of upper teeth (in mm)

		Betfia-X				Betfia-XI				Betfia-IX						Betfia-VII/1				Betfia-VII/3			
		min	x	max	n	min	x	max	n	min	x	max	n	sd	cv	min	x	max	n	min	x	max	n
C	L	—	—	—	—	—	—	—	—	—	1.47	—	1	—	—	—	—	—	—	—	—	—	—
	W	—	—	—	—	—	—	—	—	—	0.71	—	1	—	—	—	—	—	—	—	—	—	—
M ¹	L	—	—	—	—	—	—	—	—	2.23	2.34	2.45	12	0.07	2.99	—	2.20	—	1	—	—	—	—
	W	—	—	—	—	—	—	—	—	1.35	1.40	1.46	13	0.03	2.14	1.45	1.46	1.48	2	—	—	—	—
M ²	L	—	1.99*	—	1	—	2.14	—	1	1.81	1.97	2.15	23	0.07	3.55	—	—	—	—	—	—	—	—
	W	—	1.97*	—	1	—	2.12	—	1	1.89	2.02	2.10	23	0.05	2.47	—	—	—	—	—	—	—	—
M ³	L	—	—	—	—	—	—	—	—	1.62	1.66	1.72	6	0.04	2.41	—	—	—	—	—	1.66	—	1
	W	—	—	—	—	—	—	—	—	1.50	1.54	1.60	6	0.05	3.25	—	—	—	—	—	1.50	—	1

* — slightly damaged

Table VII

Talpa minor FREUDENBERG, 1914. Dimensions of mandible and lower dentition (in mm)

		Betfia-X				Betfia-XI				Betfia-IX						Betfia VII/3			
		min	x	max	n	min	x	max	n	min	x	max	n	sd	cv	min	x	max	n
P ₁	L	—	—	—	—	—	—	—	—	1.02	1.10	1.23	6	0.09	8.18	—	—	—	—
	W	—	—	—	—	—	—	—	—	0.37	0.48	0.56	6	0.07	14.58	—	—	—	—
P ₂	L	—	—	—	—	—	—	—	—	0.68	0.74	0.79	5	0.04	5.40	—	—	—	—
	W	—	—	—	—	—	—	—	—	0.30	0.33	0.35	5	0.02	6.06	—	—	—	—
P ₃	L	—	—	—	—	—	—	—	—	0.68	0.76	0.85	5	0.06	7.89	—	—	—	—
	W	—	—	—	—	—	—	—	—	0.35	0.38	0.41	5	0.02	5.26	—	—	—	—
P ₄	L	—	—	—	—	—	—	—	—	1.10	1.17	1.30	10	0.07	5.98	—	—	—	—
	W	—	—	—	—	—	—	—	—	0.54	0.58	0.62	10	0.03	5.17	—	—	—	—
M ₁	L	—	1.76	—	1	—	—	—	—	1.71	1.81	1.89	10	0.06	3.31	—	—	—	—
	W	1.07	1.11	1.15	2	—	—	—	—	1.02	1.08	1.13	10	0.03	2.78	—	—	—	—
M ₂	L	—	2.09	—	1	2.03	2.21	2.34	3	1.92	2.19	2.27	18	0.08	3.65	—	—	—	—
	W	—	1.23	—	1	1.22	1.25	1.30	3	1.10	1.24	1.30	18	0.06	4.84	—	—	—	—
M ₃	L	—	—	—	—	—	1.83	—	1	1.81	1.88	1.97	22	0.05	2.66	—	—	—	—
	W	—	—	—	—	—	0.95	—	1	0.91	0.98	1.04	21	0.04	4.08	—	—	—	—
H of mandible below P ₂		—	1.58	—	1	—	—	—	—	1.19	1.45	1.57	12	0.09	6.21	—	1.45	—	1
H of mandible below M ₁		—	2.01	—	1	—	1.85	—	1	1.46	1.66	1.89	21	0.14	8.43	1.72	1.74	1.77	2
H of ascending ramus		—	—	—	—	—	—	—	—	—	5.64	—	1	—	—	—	—	—	—

Table VIII

Talpa minor FREUDENBERG, 1914. Dimensions of humeri (in mm)

	Betfia-X				Betfia- XI				Betfia-IX						Betfia-XII			
	min	x	max	n	min	x	max	n	min	x	max	n	sd	cv	min	x	max	n
L max	—	—	—	—	—	—	—	—	10.50	10.90	11.40	13	0.30	2.75	—	—	—	—
W max	—	—	—	—	—	—	—	—	7.50	7.76	8.20	14	0.26	3.35	—	—	—	—
W diaph.	—	2.80	—	1	2.40	2.50	2.60	2	2.40	2.75	3.10	67	0.13	4.73	2,70	2.80	2.90	2

S y s t e m a t i c p o s i t i o n a n d d i s t r i b u t i o n . The tooth pattern and the morphology of teeth indicate that the remains from Betfia described above belong to the genus *Talpa*. From the recent European mole *T. europaea*, living also in Romania, they differ mostly in smaller size. It allows us to consider that they belong to *T. minor* FREUDENBERG, 1914 described from Hundsheim in Austria (as *T. europaea minor* nov. subsp.). According to RABEDER (1972) some morphological character states which seem to differ *T. minor* from *T. europaea* (talonid of the lower P4 better developed, the coronoid process more slender, the presence of two additional mental foramina etc.) are the same in both only more frequent in the recent moles.

Another small *Talpa* species, *T. gracilis*, described by KORMOS (1930) from the Early Pleistocene of Somlyóberg near Püspökfürdő (today Betfia 2) in Romania is not considered as a good species because its size and characters lie within the range of variation of *T. minor* (KRETZOI 1956, KOENIGSWALD 1970).

T. neagui RADULESCU and SAMSON, 1989 described also in Romania from Berești (MN14) and found in a second locality Mălușteni (MN15a) is known only from its humeri. They are characterized, among others, by their wide diaphysis in relation to their length. The width of this diaphysis is 3.0-3.5 mm (n = 10). In five localities of Betfia the diaphysis of the humeri are more slender and their width oscilates between 2.4 and 3.1 mm (n = 70) what excludes them from *T. neagui*.

T. minor inhabited Europe probably from the Early Pliocene to the beginning of the Middle Pleistocene. It is mentioned from several European countries e. g. from Austria (MAIS and RABEDER 1977a, 1977b), Poland (KOWALSKI 1956, 1958a, SULIMSKI 1959, 1962, BOSAK et al., 1982), Hungary (JÁNOSSY 1986), Germany (HELLER 1936, KORMOS 1937, KOENIGSWALD 1970, KOENIGSWALD et al. 1991, TOBIEN 1980 etc.), England (BISHOP 1982), Italy (DE GIULI et al., 1986) and Croatia (KOWALSKI 1958b) etc. In Romania it was mentioned by TERZEA (1994) from Betfia X.

Judging from the morphology of the humerus RADULESCU and SAMSON (1989) are of the opinion that the remains of *T. minor* from some Early Pliocene localities, e. g. from Podlesice and Weże 1 in Poland "are referable to *T. neagui*". A revision of *T. minor* remains is necessary.

According to RABEDER (1972) all small Plio/Pleistocene moles should be united in one species the name of which, taking into account the priority, must be *T. minor*.

Talpa fossilis PETENYI, 1864

M a t e r i a l . The list of specimens is given in Table IX. It contains mostly isolated upper and lower teeth (except of incisors and lower canine), few mandibles and numerous humeri.

D e s c r i p t i o n o f t h e m a t e i a l a n d c o m p a r i s o n w i t h o t h e r E u r o p e a n p o p u l a t i o n s . The remains from seven Betfia localities mentioned above belong to a rather large mole the size and morphology of which is comparable with these in the recent species *Talpa europaea* LINNAEUS, 1758. Their morphology is also identical with the morphology of *T. minor* from Betfia but their measurements practically do

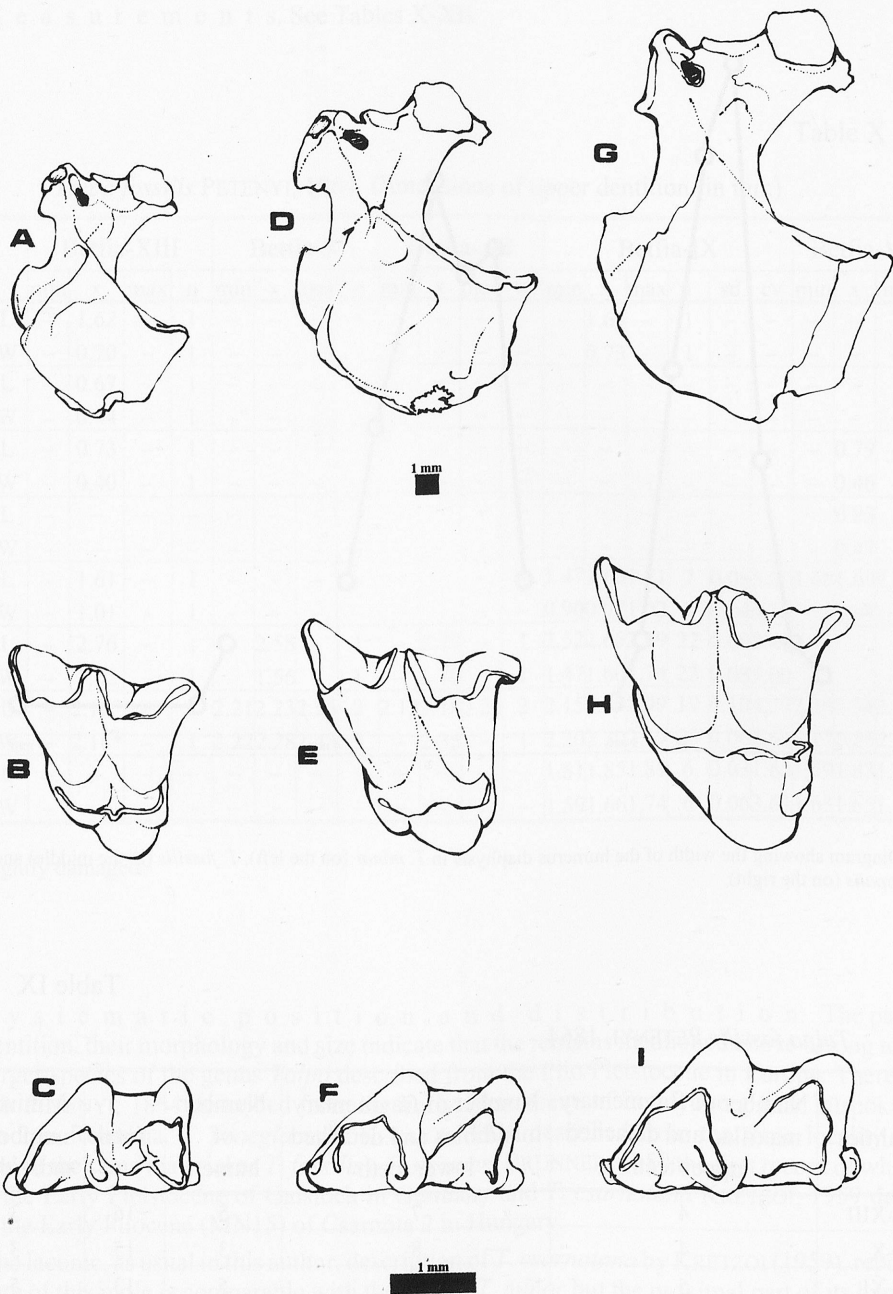


Fig. 2. Differences in size of the largest humeri in: A – *T. minor* (spec. no. 10, MTC), D – *T. fossilis* (spec. no. 7, MTC) and G – *T. cf. episcopalpis* (spec. no. 1, ISER), all from B-IX, of the largest upper M^2 in: B – *Talpa minor* (B-IX, spec. no. 31, MTC), E – *T. fossilis* (B-IX, spec. no. 34, MTC) and H – *T. cf. episcopalpis* (B-VII/3, spec. no. 1, ISER) and of the largest lower M_2 in: C – *T. minor* (B-IX, spec. no. 23, MTC), F – *T. fossilis* (B-IX, spec. no. 43, MTC) and I – *T. cf. episcopalpis* (B-VII/3, spec. no. 1, ISER).

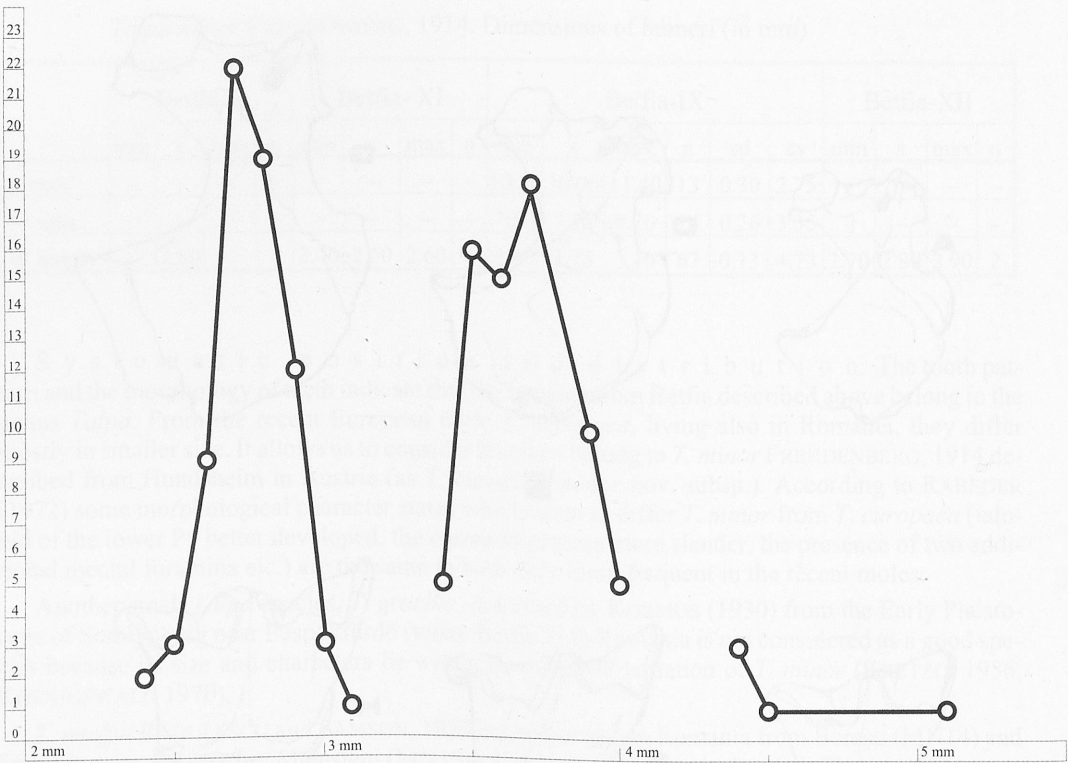


Fig. 3. Diagram showing the width of the humerus diaphysis in *T. minor* (on the left), *T. fossilis* (in the middle) and *T. cf. episcopalis* (on the right).

Table IX

Talpa fossilis PETENYI, 1864

Localities	Number of fragmentary maxillae and detached upper teeth	Number of fragmentary mandibles and detached lower teeth	Number of humeri	Total	Minimum number of individuals
Betfia-XIII	4	7	5	16	3
Betfia-X	4	8	3	15	3
Betfia-XI	5	3	5	13	5
Betfia-IX	56	79	58	193	29
Betfia-VII/1	0	4	2	6	1
Betfia-V	0	3	3	6	3
Betfia-VII/3	12	17	14	43	7
Betfia-VII/4	0	0	1	1	1

not overlap, *T. minor* being much smaller. There are no morphological and size differences between specimens from particular localities of Betfia.

M e a s u r e m e n t s. See Tables X-XII.

Table X

Talpa fossilis PETENYI, 1864. Dimensions of upper dentition (in mm)

		Betfia-XIII				Betfia-X				Betfia- XI				Betfia-IX					Betfia-VII/3				
		min	x	max	n	min	x	max	n	min	x	max	n	min	x	max	n	sd	cv	min	x	max	n
C	L	—	1.62	—	1	—	—	—	—	—	—	—	—	—	1.65	—	1	—	—	—	—	—	—
	W	—	0.70	—	1	—	—	—	—	—	—	—	—	—	0.73	—	1	—	—	—	—	—	—
P ¹	L	—	0.67	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	W	—	0.44	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
P ²	L	—	0.73	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.79	—	1
	W	—	0.40	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.46	—	1
P ³	L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.83	—	1
	W	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.47	—	1
P ⁴	L	—	1.61	—	1	—	—	—	—	—	—	—	—	1.47	1.60	1.71	7	0.08	5.00	1.65	1.69	1.74	2
	W	—	1.01	—	1	—	—	—	—	—	—	—	—	0.90	0.97	1.02	7	0.04	4.12	—	0.94	—	1
M ¹	L	—	2.76	—	1	—	2.58	—	1	—	2.77	—	1	2.52	2.65	2.79	22	0.09	3.40	—	—	—	—
	W	—	1.62	—	1	—	1.56	—	1	—	1.70	—	1	1.47	1.60	1.74	23	0.08	5.00	—	—	—	—
M ²	L	—	2.12*	—	1	2.21	2.23	2.26	2	2.12	2.18	2.25	2	2.15	2.34	2.49	19	0.10	4.27	2.26	2.34	2.42	2
	W	—	2.16*	—	1	2.22	2.28	2.43	3	—	2.35	—	1	2.20	2.30	2.39	20	0.06	2.61	2.17	2.25	2.33	2
M ₃	L	—	—	—	—	—	—	—	—	—	—	—	—	1.81	1.85	1.89	6	0.03	1.62	1.79	1.83	1.88	2
	W	—	—	—	—	—	—	—	—	—	—	—	—	1.59	1.66	1.74	6	0.06	3.61	1.63	1.65	1.67	2

* — slightly damaged

S y s t e m a t i c p o s i t i o n a n d d i s t r i b u t i o n. The pattern of the dentition, their morphology and size indicate that the remains mentioned above belong to one of the larger species of the genus *Talpa* described from the Plio/Pleistocene in Europe. There are: *T. fossilis* PETENYI, 1864 described from the Early Pleistocene of Somlyóberg near Püspökföld = Betfia 2 in Romania, *T. praeglacialis* KORMOS, 1930 described from the same locality (on the ground of the same material as *T. fossilis*), *T. stromeri* BRUNNER, 1950 the first record of which was from the Early Pleistocene of Gaisloch in Germany and *T. csarnotana* KRETZOI, 1959 described from the Early Pliocene (MN15) of Csarnóta 2 in Hungary.

The laconic, as usual in this author, description of *T. csarnotana* by KRETZOI (1959), reports that the size of this mole is comparable with the size of *T. minor* but the proximal part of its humerus is stouter and its shaft shorter.

According to SULIMSKI (1962) this Early Pliocene species comes closer in size to *T. fossilis* rather than *T. minor*, but differs from it in structure of teeth and shoulder bones. According to BRUNNER (1950) *T. stromeri* is similar to *T. praeglacialis*, but the cusps of its teeth are curved forwards. As the shafts of humeri of larger *Talpa* from Betfia localities are long and the cusps of teeth straight or curved slightly posteriorly they cannot be assigned neither to *T. csarnotana* nor *T. stromeri*.

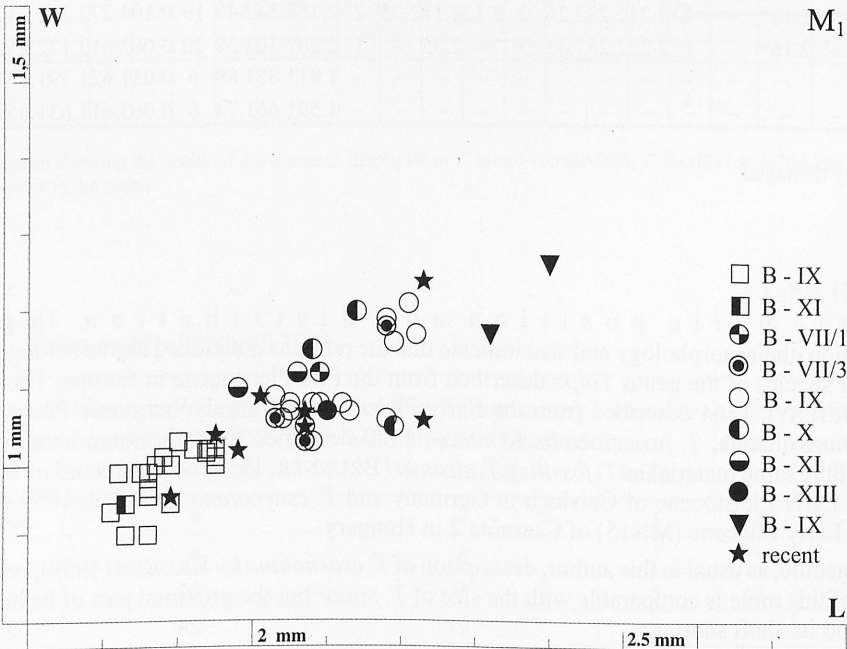
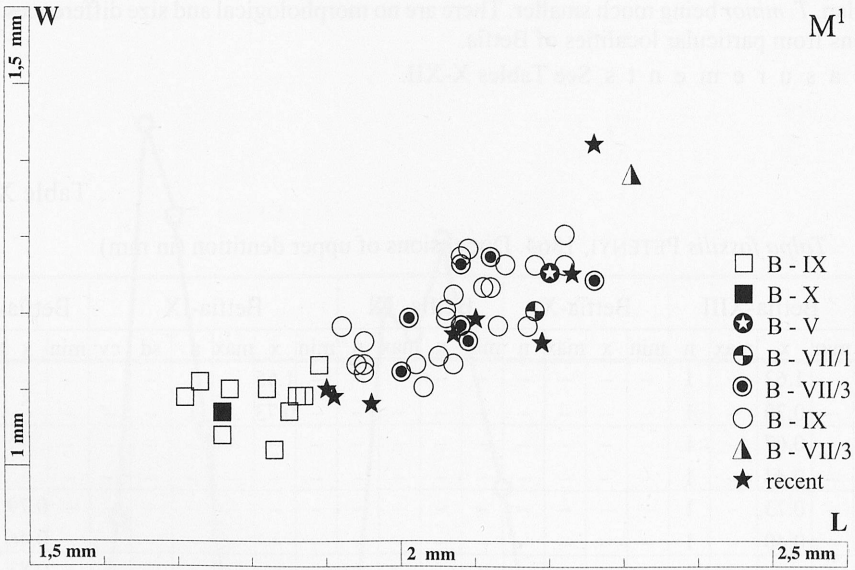


Fig. 4. Scatter-diagram showing the length (L) and width (W) (bucc.) of M^1 and M_1 in *T. minor* (squares), *T. fossilis* (circles), *T. cf. episcopalis* (triangles), all from Betfia localities, and in recent *T. europaea* from Poland (stars).

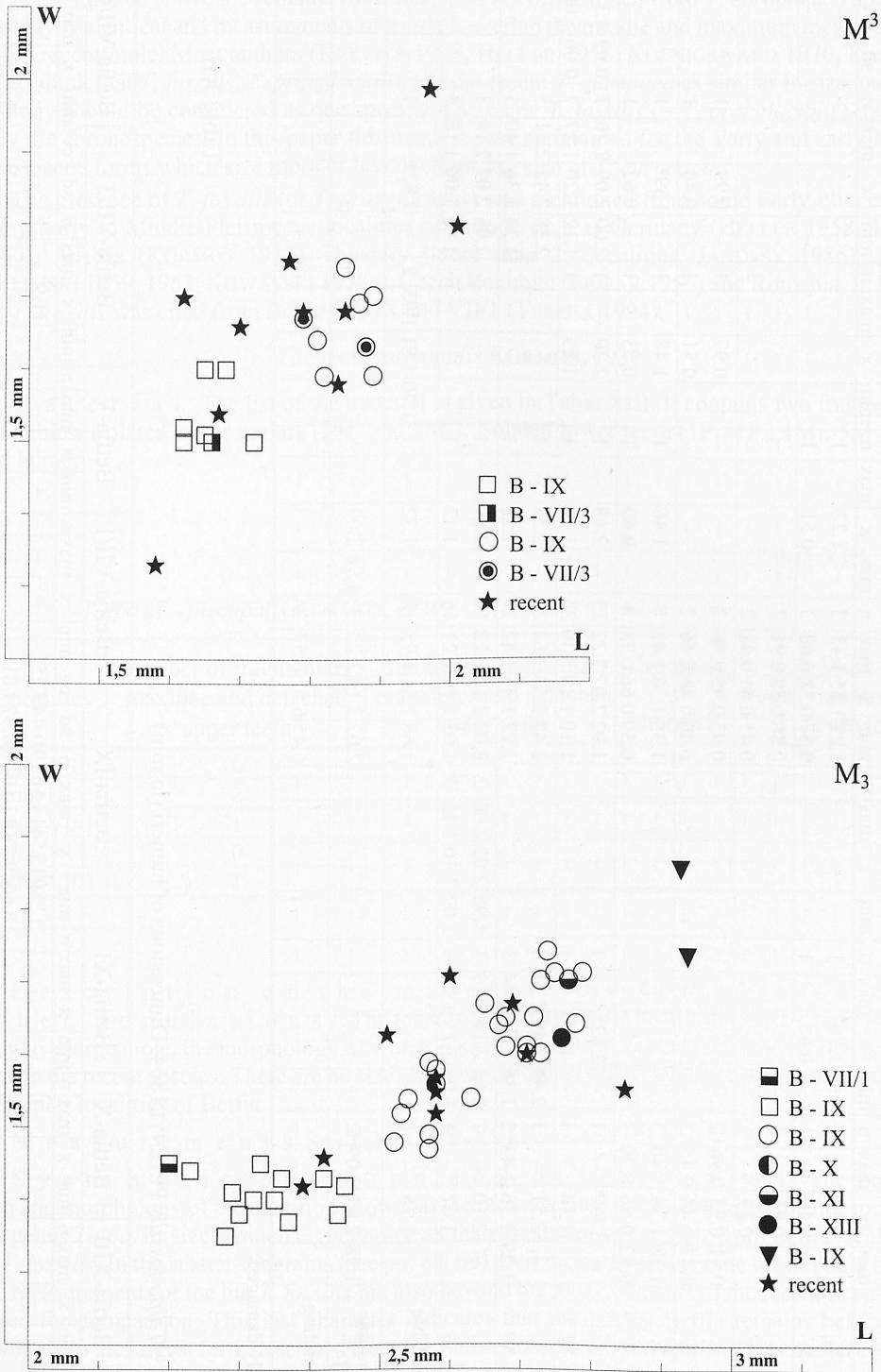


Fig. 5. Scatter-diagram showing the length (L) and width (W) (bucc.) of M³ and M₃ in *T. minor* (squares), *T. fossilis* (circles), *T. cf. episcopalis* (triangles), all from Betfia localities, and in the recent *T. europaea* from Poland (stars).

Table XI

Talpa fossilis PETENYI, 1864. Dimensions of mandible and lower dentition (in mm)

[illegible]

* – slightly damaged

Table XII

Talpa fossilis PETENYI, 1864. Dimensions of humeri (in mm)

	Betfia-XIII			Betfia-X			Betfia-XI			Betfia-IX			Betfia-VII/1			Betfia-V			Betfia-VII/3			Betfia-VII/4								
	min	x	max	n	min	x	max	n	min	x	max	n	min	x	max	n	min	x	max	n	min	x	max	n						
L max	—	—	—	—	—	—	—	—	—	12.80	13.54	14.50	19.04	43.25	—	—	—	—	—	—	—	—	—	—						
W max	—	—	—	—	—	—	—	—	—	8.60	9.78	11.10	28.04	74.81	—	—	—	—	—	—	—	—	—	—						
W diaph.	3.603	703.80	3	3.503	553.60	2	3.403	503.60	2	3.40	3.68	4.00	54.0	154.08	3.40	3.45	3.50	2	3.503	733.90	3	3.403	684.00	12	0.205	4.40	—	4.00	—	1

As mentioned above the remains from Betfia do not differ much from *T. europaea*. Their morphology is identical and measurements of its teeth overlap the middle and maximum measurements of the recent mole. Most authors (KRETZOI 1938, HELLER 1958, KOENIGSWALD 1970, RABEDER 1972) think that *T. fossilis*, *T. praeglacialis* and the recent *T. europaea* as similar in size and morphology should be considered as one species. The name *T. fossilis* (= *T. praeglacialis*) indicates only the chronospecies. In this paper this name is also maintained for the Early and early Middle Pleistocene forms which size more or less overlaps the size of *T. europaea*.

The presence of *T. fossilis* (or *T. praeglacialis*) was mentioned from some Early Pliocene and many Early to Middle Pleistocene localities of Europe such as Germany (HELLER 1958, TOBIEN 1980), Austria (KORMOS 1937), Hungary (more than 20 localities, JANOSSY 1986), Poland (SULIMSKI 1959, 1962, KOWALSKI 1958a), Czech Republic (FEJFAR 1956) and Romania. In Romania *T. fossilis* was cited from Betfia-XI, IX and VII/1 (TERZEA 1994).

Talpa cf. episcopolis KORMOS, 1930

M a t e r i a l. The list of the material is given in Table XIII. It contains two fragments of mandibles, isolated upper molars ($2M^1$ and $2M^2$), isolated lower teeth ($1P_1$, $1P_4$, $1M_1$, $5M_2$, $2M_3$) and humeri.

Table XIII

Talpa cf. episcopolis KORMOS, 1930

Localities	Number of fragmentary maxillae and detached upper teeth	Number of fragmentary mandibles and detached lower teeth	Number of humeri	Total	Minimum number of individuals
Betfia-XIII	0	1	0	1	1
Betfia-IX	2	7	5	14	3
Betfia-VII/1	1	2	0	3	1
Betfia-V	0	1	0	1	1
Betfia-VII/3	1	1	0	2	1

Description of the material and comparison with other populations. The remains from five Betfia localities cited in Table XIII belong to a large mole, the morphology of which is similar to this in *T. europaea* and its size is bigger than in the recent species. There are no size and morphological differences between specimens from particular localities of Betfia.

M e a s u r e m e n t s. See Tables XIV-XVI.

Systematic position and distribution. The tooth pattern and morphology of the dentition show that the remains cited above belong to the big species of the genus *Talpa*. Its size is much bigger however than the size of larger mole from Betfia localities e. g. *T. fossilis*. In the scatter-diagrams (see pp. 68, 69) their measurements come off not only beyond the measurements of the big *T. fossilis* but also beyond the measurements of the recent *T. europaea* taken for comparison. This last character indicates that the largest Betfia remains belong most probably to the largest form described from the Pleistocene, to *T. episcopolis*. Their humeri, seem to be also as big as those cited in the literature for *T. episcopolis*.

T. episcopolis was described by KORMOS (1930) on the ground of the postcranial bones from Somlyóberg near Püspökfürdő = Betfia 2 in Romania, the locality dated from the Early Pleistocene.

Table XIV

Talpa cf. episcopalis KORMOS, 1930. Dimensions of upper dentition (in mm)

		Betfia-IX				Betfia-VII/1				Betfia-VII/3			
		min	x	max	n	min	x	max	n	min	x	max	n
M ¹	L	2.93	2.93	2.94	2	—	—	—	—	—	—	—	—
	W	1.73	1.79	1.85	2	—	—	—	—	—	—	—	—
M ²	L	—	—	—	—	—	2.87	—	1	—	2.89	—	1
	W	—	—	—	—	—	2.82	—	1	—	2.84	—	1

Its humeri and other long bones were found also in several German localities as Fuchslotch

Table XV

Talpa cf. episcopalis KORMOS, 1930. Dimensions of mandible and lower dentition (in mm)

		Betfia-XIII				Betfia-IX				Betfia-VII/1				Betfia-V				Betfia-VII/3			
		min	x	max	n	min	x	max	n	min	x	max	n	min	x	max	n	min	x	max	n
P ₁	L	—	—	—	—	—	1.60	—	1	—	—	—	—	—	—	—	—	—	—	—	—
	W	—	—	—	—	—	0.70	—	1	—	—	—	—	—	—	—	—	—	—	—	—
P ₄	L	—	—	—	—	—	1.40	—	1	—	—	—	—	—	—	—	—	—	—	—	—
	W	—	—	—	—	—	0.77	—	1	—	—	—	—	—	—	—	—	—	—	—	—
M ₁	L	—	—	—	—	—	—	—	—	—	—	—	—	2.31	—	1	—	—	—	—	—
	W	—	—	—	—	—	—	—	—	—	—	—	—	1.38	—	1	—	—	—	—	—
M ₂	L	—	2.75	—	1	2.66	2.67	2.68	3	—	—	—	—	—	—	—	—	2.79	—	1	—
	W	—	1.42	—	1	1.42	1.44	1.45	3	—	—	—	—	—	—	—	—	1.56	—	1	—
M ₃	L	—	—	—	—	2.32	2.36	2.40	2	—	—	—	—	—	—	—	—	—	—	—	—
	W	—	—	—	—	1.17	1.21	1.26	2	—	—	—	—	—	—	—	—	—	—	—	—
H of mandible below P ₂		—	—	—	—	—	2.26	—	1	—	—	—	—	—	—	—	—	—	—	—	—
H of mandible below M ₁		—	—	—	—	—	2.70	—	1	—	3.30	—	1	—	—	—	—	—	—	—	—

Table XVI

Talpa cf. episcopalis KORMOS, 1930. Dimensions of humeri (in mm)

	Betfia-IX			
	min	x	max	n
L max	—	17.40	—	1
W max	—	12.50	—	1
W diaph.	4.40	4.56	5.10	5

(BRUNNER 1954), Breitenberghöhle (BRUNNER 1957), Erpfingen (HELLER 1958) etc., and at Hundsheim in Austria (KORMOS 1937). One mandible of this species was found later in Somlyóberg, but their measurements were never cited.

The only tooth dimensions of *T. episcopalis* cited in the literature are these given by BRUNNER (1957) from Breitenberghöhle. They concern the length of lower P_1 (1.5-1.7 mm) and lower P_4 (1.4-1.7 mm) and they agree with the length of these teeth in the specimens from Betfia. The length of the unique undamaged humerus from Betfia seems to lie also in the range of variation (17.0-19.3 mm, KORMOS 1930, 1937, BRUNNER 1957) of *T. episcopalis*.

As the material of the largest mole from Betfia is very limited and consists mostly of teeth and as the teeth of *T. episcopalis* are practically not known the specimens from Betfia are identified as *T. cf. episcopalis*.

T. episcopalis is always very rare among the fossil materials. If its identification in the Betfia materials is really correct it appeared as the third species of mole (together with *T. minor* and *T. fossilis*) in three (B-IX, B-VII/1, B-VII/3) of five localities in which it was present. It is not, however, exceptional, such situations are known also from its type locality and e. g. from Erpfingen (HELLER 1958).

Subfamily Desmaninae THOMAS, 1912

Genus *Desmana* Guldenstaedt, 1777

Desmana thermalis KORMOS, 1930

M a t e r i a l. B-XIII and B-IX. The material contains isolated upper and lower teeth: I_1^3 , I_1^P , $2M^3$, $1M_1$ and one fragment of mandible without teeth and processes (minimum number of individuals = 2) from B-XIII and $1M^1$ (minimum number of individuals = 1) from B-IX.

D e s c r i p t i o n o f t h e m a t e r i a l a n d c o m p a r i s o n w i t h o t h e r E u r o p e a n p o p u l a t i o n s. The remains of *Desmana* from B-XIII and B-IX characterize themselves by a large size and by the morphology of the upper premolar P^1 which single root is vertically grooved. A description of detailed morphology and measurements of *D. thermalis* can be found in KORMOS (1930) and RÜMKE (1985). The remains from two Betfia localities do not differ in size and morphology from other European populations of this species.

M e a s u r e m e n t s. See Table XVII.

Table XVII

Desmana thermalis KORMOS, 1930. Dimensions of upper and lower dentition (in mm)

	Betfia-XIII					
	1	2	3	4	5	6
I^3	1.17	—	—	—	—	—
	1.17	—	—	—	—	—
P^1	—	—	—	1.91	—	—
	—	—	—	1.62	—	—
M^3	—	2.01	2.13	—	—	—
	—	2.74	—	—	—	—
M_1	—	—	—	—	3.45	—
	—	—	—	—	2.67	—
H of mandible behind P_4	—	—	—	—	—	3.00*

* — slightly damaged

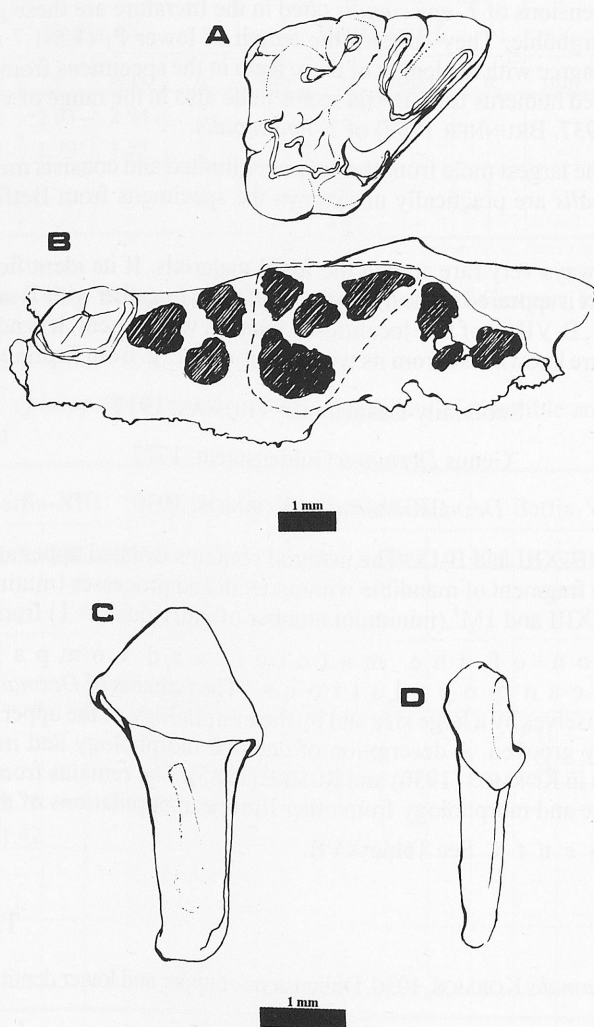


Fig. 6. A-B – differences in size between: A – M^1 of *Desmana thermalis* (spec. no. 1, ISER) and B – *Galemys* cf. *semseyi* (spec. no. 1, MTC) from B-IX; C-D – isolated teeth: C – P^1 of *D. thermalis* (B-XIII, spec. no. 4, ISER) and D – I_3 of *Galemys* cf. *semseyi* (B-VII/1, spec. no. 1, ISER).

Systematic position and distribution. Although the material is very scarce and most of the diagnostic teeth are lacking, the large size and the morphology of the remaining teeth (especially of the P^1) refer them to the genus *Desmana* and the species *Desmana thermalis*.

D. thermalis was described by KORMOS (1930) from the Early Pleistocene locality of Somlyóberg near Püspökfürdő (now Betfia 2). It was also found in the Late Pliocene in The Netherlands

and in the Early Pleistocene in Hungary (RÜMKE 1985), Austria (RABEDER 1972) and Germany (HELLER 1954). TERZEA (1994) listed it from B-XIII.

Genus *Galemys* KAUP, 1829

Galemys cf. *semseyi* KORMOS, 1913

M a t e r i a l. B-IX and B-VII/1. The material consists of one fragment of maxilla with P^3 from B-IX (minimum number of individuals = 1) and I_3 and one small fragment of toothless mandible without processes from B-VII/1 (minimum number of individuals = 1).

D e s c r i p t i o n o f t h e m a t e r i a l a n d c o m p a r i s o n w i t h o t h e r p o p u l a t i o n s. The maxillary fragment contains the third premolar P^3 and alveoli of P^4 , M^1 and buccal ones of M^2 . The P^3 is sub-triangular in the occlusal view and it has three roots. Its only cusp is situated in the middle of the tooth. A sharp ridge is running from its top to the posterobuccal side of the crown. The buccal side of the tooth is convex, the lingual one straight in its anterior and concave in its posterior side. A very weak buccal cingulum is present in the posterior part of the crown. The lingual cingulum is strong and protruding. It ends by small cusps in the anterior and posterior part of the crown. The third small cusp is visible on the lingual widening of the tooth, above the lingual root.

The third lower incisor, I_3 , is very small and one-rooted. Its only cusp is situated in the anterior part of the tooth. A weak ridge goes from its top to the posterobuccal side of the crown and it ends by a small cusp. The anterior and buccal sides of the crown are slightly convex, the lingual is straight and the posterior one slightly concave. The cingulum is absent.

In the fragment of the mandible alveoli of P_2 , P_3 , P_4 and M_1 have been preserved. The alveoli of P_3 have an oblique position in relation to the longitudinal axis of the mandible. Two mental foramina are present: one between P_1 and P_2 and one between M_1 and M_2 .

A comparison of specimens mentioned above with other populations is impossible because, so far, the teeth (P^3 and I_3) found in the material from B-IX and B-VII/1 are not known from elsewhere else.

M e a s u r e m e n t s. B-IX: P^3 L 1.85 mm, W 1.36 mm. B-VII/1: I_3 L 0.96 mm, W 0.91 mm; H of mandible behind P_4 2.64 mm.

S y s t e m a t i c p o s i t i o n a n d d i s t r i b u t i o n. The dimensions cited above show that these specimens represent a small water-mole. Judging from the size of the alveoli of M^1 this tooth must have been much smaller than the first upper molar of *D. thermalis* found in the same locality (B-IX). Also the height of mandible behind P_4 is lower not only from the mandible of the large *D. thermalis*, but also from smaller *D. nehringi* KORMOS, 1913 and even smaller *Galemys kormosi* (SCHREUDER), 1940 (RZEBIK-KOWALSKA 1971).

Although the material is so scarce and presented teeth were unknown so far, the small size of remains from B-IX and B-VII/1 suggests that they could belong to *G. semseyi*. This species was described by KORMOS in 1913 from the Early Pleistocene locality Somlyóberg near Püspökföld (now Betfia 2), in the same region as B-IX and B-VII/1. That is why the remains described above have been tentatively included into *G. semseyi*.

So far, *G. semseyi* was not found outside its type locality.

Table XVIII

Localities and fauna of hedgehogs and moles.

Species	Localities								
	B-XIII	B-X	B-XI	B-IX	B-VII/1	B-V	B-VII/3	B-XII	B-VII/4
<i>Erinaceus</i> sp.1	+	–	–	–	–	–	–	–	–
<i>Erinaceus</i> sp.2	–	–	–	+	+	–	–	–	–
<i>Erinaceus</i> sp.3	–	–	–	–	–	+	+	–	+
<i>T. minor</i>	–	+	+	+	+	–	+	+	–
<i>T. fossilis</i>	+	+	+	+	+	+	+	–	+
<i>T. cf. episcopalis</i>	+	–	–	+	+	+	+	–	–
<i>D. thermalis</i>	+	–	–	+	–	–	–	–	–
<i>T. cf. semsey</i>	–	–	–	+	+	–	–	–	–

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