

**Erinaceomorpha and Soricomorpha (Mammalia)  
from the Miocene of Bełchatów, Poland.  
IV. Erinaceidae FISCHER VON WALDHEIM, 1817  
and Talpidae FISCHER VON WALDHEIM, 1817**

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Abstract. Very scarce remains of Erinaceidae and Talpidae have been found in three different layers of Miocene sediments in Bełchatów in central Poland. Talpidae gen. et sp. indet. and *Desmanella* cf. *engesseri* were stated in horizon C, dated from the Middle (MN4 or MN4/MN5) Miocene, *Lanthanotherium* aff. *sansaniense*, *Mygalea* cf. *antiqua*, *Talpa minuta*, “*Scaptonyx*” cf. *edwardsi* and *Desmanella engesseri* in horizon B, dated from the Middle (MN5 or MN5/MN6) Miocene and ?*Talpa minuta*, *Desmanella* cf. *stehlini* and Talpidae gen. et sp. indet. in horizon A, dated from the late Middle (MN7+8) or Middle/Late (MN7+8/MN9) Miocene boundary. The remains are described and illustrated and their systematic position is discussed.

Key words: fossil mammals, Insectivora, Erinaceidae and Talpidae, Miocene, Poland.

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## I. INTRODUCTION

The present paper is the fourth part of a series of studies on the remains of Erinaceomorpha and Soricomorpha from the Miocene locality of Bełchatów in central Poland. The previous papers (RZEBIK-KOWALSKA 1993, 1994, 1996) dealt with Metacodontidae (=Plesiosoricidae), Soricidae, and Dimylidae.

The layers containing fossil mammals at Bełchatów called Bełchatów C, B, and A represent biozones MN4 or MN4/MN5, MN5 or MN5/MN6 and MN7+8 or MN7+8/MN9 respectively. A detailed description of the locality from which the material for this study has been obtained, as well as a discussion of its age and paleoenvironment, are given by BURCHART et al. (1988), STWORZEWICZ and SZYNKIEWICZ (1989), STUCLIK et al. (1990), KOWALSKI (1993a, b), STWORZEWICZ (1999), and KOWALSKI and RZEBIK-KOWALSKA (2002). Measurements were taken according to the pattern used for Talpidae by HUTCHISON (1974) and Erinaceidae by de JONG (1988). The highest number of identical elements (e. g., right first lower molar  $M_1$ ) was used to represent the minimum number of individuals.

The specimens described are housed in the collection of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Cracow.

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## II. SYSTEMATIC PART

Family Erinaceidae FISCHER VON WALDHEIM, 1817

Subfamily Galericinae POMEL, 1848

Genus *Lanthanotherium* FILHOL, 1888

*Lanthanotherium* aff. *sansaniense* (LARTET, 1851)

**M a t e r i a l.** Bełchatów B. The following upper and lower teeth or their fragments were found: one fragment of  $M^1$  sin., two  $M^3$  sin., one  $M^3$  dext., one fragment of  $M^3$  dext., one  $?I_2$  sin., one  $P_3$  dext., two trigonids of  $M_1$  dext., one trigonid of  $M_1$  sin., two talonids of  $M_1$  dext., one talonid of  $M_1$  sin., one trigonid of  $M_2$  sin., one trigonid of  $M_3$  sin., one trigonid of  $M_3$  dext., and one talonid of  $M_3$  sin., (No. MF/2317), Fig. 1A-G.

Minimum number of individuals = 2 (see above).

**D e s c r i p t i o n o f t h e m a t e r i a l.**  $M^1$  is broken in its postero-buccal part. The metacone, metastyle and postero-buccal part of the metaconule are absent, and the paracone damaged. In spite of this damage, it is clear that the outline of the occlusal surface of  $M^1$  was almost square. The metaconule is coniform and in its preserved antero-lingual part isolated from the paracone, protocone and hypocone by a narrow groove. It is situated more or less in the centre of the tooth. A small protoconule is present. The protocone and hypocone are separated by a deep valley bordered by a weak cingulum. A large cingulum is present along the anterior side of the tooth.

$M^3$  has three roots. The outline of its occlusal surface is triangular. Its five cusps (the paracone, metacone, protocone, hypocone and protoconule) are connected by the ridges, bordering the trigon basin. The ridge connecting the paraconule and the protocone is the highest, and these connecting the paracone and metacone, the metacone and hypocone and the paracone and paraconule are notched. The largest cusp is the protocone. As in  $M^1$  the protocone and hypocone are separated by a valley, but cingulum bordering it is well developed. The sixth cusp, the parastyle, is low. It lies in front of the paracone. The buccal and anterior cingula are well developed.

$?I_2$  has one root and is slightly convex in its buccal and concave in its lingual side. The posterior side of its sharp cutting edge ends in the small cingular cusp. A weak lingual cingulum is present.

$P_3$  is slightly damaged in its posterior and upper parts. It has two roots. Its main cusp, in the shape of the triangular pyramid, has its tip curved slightly backwards. The antero-central part of the crown is bent upward forming a small cusp, the posterior part is very short and flat, but in its central part a small cusp was probably also present. The postero-lingual part of the crown is slightly convex. A very weak cingulum is visible in the antero-buccal and postero-lingual corners of this tooth.

As mentioned above, only isolated trigonids and talonids of  $M_1$  are present. The anterior part of the trigonid crown is narrow and pointed because the paraconid lies almost directly in front of the metaconid, at the end of a long paralophid. The highest cusp is the protoconid, the paraconid and metaconid are more or less of the same height. The buccal cingulum is large and protruding.

The talonid is shorter than trigonid and has the hypoconid lower than the entoconid. The ridge connecting the hypoconid and entoconid is notched. The posterior cingulum meets the posterior arm of the entoconid crossing the posterior wall of  $M_1$ .

The trigonid of  $M_2$  differs from this element in  $M_1$ . The anterior part of its crown is wide and rounded because the blade-like paraconid, totally incorporated in the short paralophid, does not lie in front of the metaconid as in  $M_1$  but in the middle, between the metaconid and the protoconid.

The trigonid of  $M_3$  resembles that of  $M_2$  but its talonid is narrower than the  $M_2$  talonid. The buccal cingulum is wide and protruding. It ends at the end of the re-entrant valley. The posterior cingulum is similar to that in  $M_1$ , and the anterior and lingual cingula are absent.

Measurements. See Table I and II.

Table I

*Lanthanotherium* aff. *sansaniense* (LARTET, 1851) from Bełchatów B. Dimensions of upper and lower teeth (in mm)

No. of specimen		1	2	3	4	5
$M^3$	L	2.11	2.02	1.92	–	–
	W	2.25	2.07	2.05	–	–
$?I_2$	L	–	–	–	1.21	–
	W	–	–	–	0.59	–
$P_3$	L	–	–	–	–	1.56
	W	–	–	–	–	0.92

Table II

Dimensions (in mm) of  $M^3$  and  $P_3$  in *L. sansaniense* and *L. aff. sansaniense* from several Middle Miocene localities of Europe

		BAUDELLOT (1972)	SCHÖTZ (1988)	BOLLIGER (1992)	ZIEGLER and MÖRS (2000)	ZIEGLER (2000)
		Bełchatów B (MN5)	Massendorf (MN5)	Tobel-Hombrechtikon and Hueb-Wald* (MN5/MN6) (MN6*)	Hambach 6C (MN5)	Sandelzhausen (MN6)
		<i>L. sansaniense</i>	<i>L. aff. sansaniense</i>	<i>L. aff. sansaniense</i>	<i>L. aff. sansaniense</i>	<i>L. aff. sansaniense</i>
$M^3$	L	1.92, 2.02, 2.11 x = 2.02, n = 3	2.15	1.92, 1.88, 2.04, 1.92, 2.00* x = 1.94, n = 4	2.05-2.31 x = 2.21, n = 4	2.12
	W	2.05, 2.07, 2.25 x = 2.12, n = 3	2.23	2.00, 2.12, 2.20, ? , 2.19* x = 2.11, n = 3	2.14-2.42 x = 2.28, n = 4	2.18
$P_3$	L	1.56 x = 1.52, n = 7	–	–	–	–
	W	0.92 x = 0.92, n = 2	–	–	–	–

**S y s t e m a t i c p o s i t i o n.** As noted above, the material is very limited and badly preserved. Nevertheless, four triangular  $M^3$  suggest that at least these teeth but also the remaining ones belong to the Galericinae. Characters such as the square  $M^1$  with a coniform isolated metacornule, the triangular  $M^3$  with five cusps surrounding the trigonid valley, massive and wide lower molars the cusps of which are widely spread (separated) and trigonids being longer than talonids allow us to assign these Galericinae teeth to the genus *Lantherotherium* FILHOL, 1888.

So far, six species of this genus have been described in the Miocene of Europe. There are: *L. piveteaui* CRUSAFONT, VILLATA and TRUYOLS, 1955 from Can Cerdas in Spain (Early Miocene, MN4), *L. lactorensis* BAUDELLOT and CROUSEL, 1976 from Navère in France, (Early Miocene, MN3/MN4), *L. longirostre* THENIUS, 1949 from Leoben in Austria (Middle Miocene, MN5), *L. sansaniense* (LARTET, 1851) found for the first time at Sansan in France (Middle Miocene, MN6) and cited later also from Switzerland, Germany, the Czech Republic (ZIEGLER 1999), and Serbia (MARKOVIC 2003), *L. robustum* VIRET, 1940 from La Grive in France (Middle Miocene, MN7+8), and *L. sanmigueli* VILLATA and CRUSAFONT, 1944 from Viladecaballs in Spain (Late Miocene, Vallesian), found later also in France, Germany, Austria and Hungary (ZIEGLER 1999).

Two species, *L. lactorensis* and *L. piveteaui* are older (MN3/4 and MN4) than *Lantherotherium* from Bełchatów B. Besides, the first species, *L. lactorensis*, is known only from a small fragment of mandible with  $P_2$  and  $P_4$ , teeth lacking in Bełchatów B, which makes their comparison impossible. According to CRUSAFONT et al. (1955), *L. piveteaui* is smaller and more primitive than a typical *L. sansaniense*. It is also smaller than specimens from Bełchatów B. The presence of *L. robustum* and *L. sanmigueli* is also little probable because the first one is larger and the second one smaller than *Lantherotherium* from Bełchatów B. Besides, both of them are geologically much younger (MN7+8, and Vallesian respectively). Three from four mentioned above species: *L. lactorensis*, *L. piveteaui*, and *L. robustum* are known only from their type localities.

From the geological point of view specimens from Bełchatów B are contemporaneous with *L. longirostre* from Leoben in Austria, a locality of the similar age (MN5) as Bełchatów B. So far, this species has been also known only from its type locality. According to THENIUS (1949) it is characterized by a long mandible concave in its lower margin under premolars, by spatulated  $I_1$  and  $I_2$  lying obliquely in mandible, and by very small  $P_2$  and  $P_3$  in comparison to  $P_4$ . In Bełchatów B material the mandible is lacking and  $?I_2$  is worn, so that the shape of its crown is not clear. The  $P_3$ , however, is quite large, its size being comparable with the size of this tooth in *L. sansaniense* from Sansan (see Table II).

In general, specimens from Bełchatów B are most similar, especially in their dimensions, to *L. sansaniense*, and particularly to *L. aff. sansaniense* from Massendorf in Germany (SCHÖTZ 1988). As mentioned above, this species has been found in several European localities dated from the MN6-MN8, but besides Massendorf a little older (MN5 and MN5/MN6), and smaller form, described as *L. aff. sansaniense*, was also present in Europe in such localities as Hambach 6C in Germany and Vermes 1 and Tobel-Homberchtikon in Switzerland. According to ZIEGLER (1999) this small form can represent the ancestor of *L. sansaniense*. On account of the scarcity of the material the remains from Bełchatów B are tentatively included to *L. aff. sansaniense*.

ZIEGLER and MÖRS (2000) and VAN DEN HOEK OSTENDE and DOUKAS (2003) indicated the presence of a relatively rare genus *Lantherotherium* in Hambach 6C (Germany) and Bełchatów B (Poland) instead of more common in the most localities of Europe Galericipini, *Galerix symeonidisi* DOUKAS, 1986 or *G. exilis* (BLAINVILLE, 1939). According to them this fact resulted probably from ecological, more humid conditions in these localities, both situated in the lignite mines.

According to ZIEGLER (1983) and VAN DEN HOEK OSTENDE and DOUKAS (2003) *G. symeonidisi*, and especially *G. exilis* lived in relatively dry environments, drier than *Lantherotherium*.

However, this opinion needs farther studies because e. g. in France *Lantherotherium sansaniense* and *G. exilis* were found together at the locality of Sansan.

## Family Talpidae FISCHER VON WALDHEIM, 1817

## Subfamily Desmaninae THOMAS, 1912

Genus *Mygalea* SCHREUDER, 1940*Mygalea* cf. *antiqua* (POMEL, 1848)

**M a t e r i a l.** Bełchatów B. One fragment of M<sup>1</sup> dext., one M<sup>2</sup> sin., one M<sup>3</sup> dext., one M<sub>2</sub> sin., two M<sub>3</sub> sin., one M<sub>3</sub> dext., and one fragment of the humerus (dext.), (No. MF/2318), Figs 2E-H and 3B.

Minimum number of individuals = 2 (see above).

**D e s c r i p t i o n o f t h e m a t e r i a l.** The M<sup>1</sup> is broken in its antero-buccal side, the parastyle and a part of the paracone and mesostyle are lacking. The metacone is much higher than other cusps. The protoconule is small but distinct, the metaconule is well developed and separated from the postprotocrista by a notch. The postmetaconule crista joins the narrow metacingulum.

M<sup>2</sup> has a robust appearance. The metacone is the highest, the protoconule, protocone, and metaconule are well developed. The mesostyle is deeply divided. The ectoloph is concave. The pre-paraconule crista joins the paracingulum. It is wide, especially near the parastyle. The metacingulum joining the postmetaconule crista is weak. The buccal and lingual cingula are lacking.

M<sup>3</sup> is small. The mesostyle is deeply divided and its two cusps are well separated. The protoconule and especially the metaconule are weak. The paracingulum and the parastyle are well developed. The metacingulum is absent.

M<sub>2</sub> has the trigonid that is only slightly narrower than the talonid and the protoconid distinctly higher than the hypoconid. A strong cingulum extends from below the paraconid to the end of the hypoflexid. The postcingulid and the entostylid are well developed. The lingual cingulum is lacking. The oblique cristid terminates high at the posterior wall of the trigonid, lingually to the protocristid notch, almost against the tip of the metaconid.

The trigonid of M<sub>3</sub> is somewhat wider than talonid and the oblique cristid terminates a little lower than on M<sub>2</sub>. The tooth is devoid of its post and of lingual cingulids.

The proximal and distal epiphyses of humerus are broken off. The shaft is slender. The teres tubercle is not very long. The pectoral tubercle extends distally as far as the teres tubercle.

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

**S y s t e m a t i c p o s i t i o n.** The size and morphology (divided mesostyle and well developed lingual part of upper molars) indicate that the specimens from Bełchatów B belong to the genus *Desmanodon* ENGESSER, 1980 (Talpidae incertae sedis) or to one of the Desmaninae genera, most probably to the *Mygalea* SCHREUDER, 1940.

As concerns the *Desmanodon*, it was described from Turkey, but now it is also known in European countries such as Germany, Greece and Spain (ZIEGLER 1985, ZIEGLER and FAHLBUSCH 1986, ZIEGLER 2003, DOUKAS 1986, VAN DEN HOEK OSTENDE 1997).

With the exception of the largest species, *D. major* ENGESSER, 1980 described from Turkey, the remaining, especially European ones – *D. antiquus* ZIEGLER, 1985 described from Rembach in Germany (MN4), *D. meuleni* DOUKAS, 1986 found at Aliveri in Greece (MN4), and *D. daamsi* VAN DEN HOEK OSTENDE, 1997 described from Rubielos de Mora in Spain (MN4) – are more or less of the similar size, also similar to the species of *Mygalea* and the specimens from Bełchatów B. However, in comparison with *Mygalea* and Bełchatów B, their teeth seem to be more robust, and, besides, their morphology is somewhat different. As a rule, the upper molars are devoid of the protoconule, their parastyle and metastyle are slightly bent, and the protocone is strong and more individualized lingually, which makes the lingual side of teeth more pointed. In lower molars the oblique cristid is rather short and terminates low. M<sub>3</sub> is a little reduced.

Table III

*Mygalea cf. antiqua* from Bełchatów B. Dimensions of upper and lower dentition and humerus (in mm)

No. of specimen		1	2	3	4	5	6	7
M <sup>2</sup>	L	2.05	–	–	–	–	–	–
	W	2.32	–	–	–	–	–	–
M <sup>3</sup>	L	–	1.26	–	–	–	–	–
	W	–	1.68	–	–	–	–	–
M <sub>2</sub>	L	–	–	2.20	–	–	–	–
	W	–	–	1.26	–	–	–	–
M <sub>3</sub>	L	–	–	–	1.81	1.73	1.74	–
	W	–	–	–	1.00	1.02	1.02	–
Humerus DS*		–	–	–	–	–	–	2.35

\* DS – diameter of the shaft

As concerns *Mygalea*, in the Miocene of Europe the genus is represented by three species. The most common is *M. antiqua* (POMEL, 1848) described from Sansan (MN6) in France. It is also cited from several localities in Switzerland and Germany, dated from MN4 to MN7+8 (KÄLIN 1993, ZIEGLER and MÖRS 2000, SACH and HEIZMANN 2001, ZIEGLER 2003). *M. jaegeri* (SEEMANN, 1938) was described from Viehhausen (MN5) in Germany. This species is known only from this country and faunas correlated with MN1-MN2, and MN5 (ZIEGLER 1990, 2000). The last species, *M. magna*, was described from Budenheim (MN2), also in Germany, but it is known, so far, only from its type locality (ZIEGLER 1990).

As mentioned above, the teeth from Bełchatów B are not as robust as those of *Desmanodon* and their morphological characters are more similar to *Mygalea* than to the *Desmanodon* species. As in *Mygalea*, the upper molars are characterized by the presence of protoconule (seen even in the used M<sup>1</sup>), their parastyle and metastyle are straight, not bent, and the protocone is not very pronounced lingually, which makes the lingual side of teeth wider than in *Desmanodon* species. Besides, the M<sup>3</sup> of Bełchatów B agrees in its proportions to *Mygalea* and not to *Desmanodon*. In Bełchatów B and *Mygalea* the tooth is longer than wide, while in *Desmanodon* it is wider than long. In the lower molars, in Bełchatów B and *Mygalea* species, the oblique cristids are long and they terminate high lingually at the posterior wall of the trigonids, and the talonid of M<sub>3</sub> is not reduced, more or less of the same width as the trigonid.

The comparison of M<sub>3</sub> of different species of *Desmanodon* and *Mygalea* (except of *D. major*) indicates that they have more or less similar size. In *Mygalea* this element is longer (L = 1.55-2.09 mm, n = 7) (ZIEGLER 1990) than in *Desmanodon* (L = 1.42-1.68 mm, n = 6) (ENGESSER 1980, ZIEGLER 1985, DOUKAS 1986, VAN DEN HOEK OSTENDE 1997). The specimens from Bełchatów B lie in the range of variation of *Mygalea* species (L = 1.73-1.81 mm, n = 3).

The preserved shaft of humerus in Bełchatów B, which is long and slender, suggests that it also belonged rather to *Mygalea* than to *Desmanodon*, in which the broad shaft gives it a compact appearance.

Taking into account the size of *Mygalea* species, specimens from Bełchatów B are most similar to *M. antiqua*, *M. magna* being certainly larger, and *M. jaegeri* a little smaller. In morphological characters they also resemble *M. antiqua*. For instance in contradiction to the  $M_3$  of *M. jaegeri* characterized by the presence of the posterior cingulum and entostylid (Sandelzhausen, ZIEGLER 2000), the  $M_3$  of *M. antiqua* has this cingulum rudimentary (Petersbuch 6, ZIEGLER 2003) or, similarly to  $M_3$  from Bełchatów B, it is devoid of posterior cingulum (*M. cf. antiqua*, Hambach 6C, ZIEGLER and MÖRS 2000). However, the  $M_2$  and  $M_3$  from Bełchatów B are devoid of hypoconulids in contrast to *M. cf. antiqua* from Hambach 6C, in which they are present.

A shape of the ectoloph in  $M^2$ , which in *Mygalea* species may be straight or concave, as the character is very variable, seems to be of very limited use in identification of different forms. The concave ectoloph of  $M^2$  is considered by ZIEGLER (2000) as characteristic of *M. jaegeri*. However, in *M. cf. antiqua* from Hambach 6C (ZIEGLER and MÖRS 2000) it is even more deeply concave. The concave ectoloph is also present in  $M^2$  from Bełchatów B.

Taking into account these small differences specimens from Bełchatów B are tentatively included in *M. cf. antiqua*.

In 1985 RÜMKE excluded *Mygalea* from the subfamily Desmaninae. At the same time she admitted of the possibility that *Mygalea* could be ancestral to the Desmaninae. She wrote: "It may be that *Mygalea* is ancestral to the Desmaninae, but allocation to the subfamily is not justified, unless its intermediate position can be demonstrated".

However, according to the author of the present paper, as well as others (ZIEGLER 1999, VAN DEN HOEK OSTENDE pers. comm.), the morphology of *Mygalea* teeth, especially of upper molars characterized by divided mesostyle and strongly developed their lingual part (the presence of strongly individualized proto- and metaconules), seems to support its position within the Desmaninae.

#### Subfamily Talpinae FISCHER VON WALDHEIM, 1817

##### Tribe Talpini FISCHER VON WALDHEIM, 1817

##### Genus *Talpa* LINNAEUS, 1758

##### *Talpa minuta* BLAINVILLE, 1838

**M a t e r i a l.** Bełchatów B. One  $M^2$  dext., (No. MF/2319), Fig. 2C.

Minimum number of individuals = 1 (see above).

**D e s c r i p t i o n o f t h e m a t e r i a l.** The parastyle is broken. The paraconule and the metaconule are only barely differentiated. The preparaconule crista terminates at the basis of the paracone, and the postmetaconule crista at the basis of the metacone. The paracingulum and metacingulum are absent. The mesostyle is undivided.

**M e a s u r e m e n t s.**  $M^2$  - L(max.) = 1.50 mm, W(max.) = 1.96 mm.

**S y s t e m a t i c p o s i t i o n.** The small size, the morphology and proportions of the upper  $M^2$  from Bełchatów B exclude its membership in such Early and Middle Miocene genera of Talpinae as *Paratalpa* LAVOCAT, 1951, *Geotrypus* POMEL, 1848, *Proscapanus* GAILLARD, 1899, *Myxomygale* FILHOL, 1890, *Huguenaya* VAN DEN HOEK OSTENDE, 1989, *Leptosaptor* ZIEGLER, 2003 and *Tenuibrachiatum* ZIEGLER, 2003. This size is the nearest to the size of  $M^2$  in "*Scaptonyx*" *edwardsi* GAILLARD, 1899 and *Talpa minuta* BLAINVILLE, 1838, especially to *T. minuta* described from Sandelzhausen in Germany, locality dated from the similar age, MN5 (ZIEGLER 2000). As to its morphology, it differs from the tooth of "*Scaptonyx*" *edwardsi* by the lack of the paracingulum. On the other hand, having confluent mesostyle, vaguely defined paraconulus and metaconulus, and lacking the para- and metacingulum, it is almost identical with  $M^2$  of the Recent *Talpa europaea* LINNAEUS, 1758. These features and its small size allow to identify it as *T. minuta*. As concerns *T. tenuidentata* ZIEGLER, 1990 described from the Ulm-Westangente in

Germany (MN2a), the comparison is difficult because ZIEGLER gave neither measurements nor description of the M<sup>2</sup>. As a very old form it is hardly probable in the assemblage of Bełchatów B.

*?Talpa minuta*

**M a t e r i a l.** Bełchatów A. One distal fragment of the humerus (dext.), (No. MF/2322), Fig. 3C.

Minimum number of individuals = 1.

**D e s c r i p t i o n** of the material. Its ectepicondyle, entepicondyle and capitulum are broken. Only the trochlea, and medium size olecranon and supratrochlear fossae are present.

**M e a s u r e m e n t s.** Diameter of the shaft (=WD – width of the diaphysis) = 2.42 mm.

**S y s t e m a t i c p o s i t i o n.** Taking into consideration the Miocene Talpidae, the size of the humerus diaphysis from Bełchatów A is comparable with this in *Mygalea* (Desmaninae), especially with *Mygalea* cf. *antiqua* from Hambach 6C (MN5/MN6) in Germany, the size of which equals 2.45-2.80 mm (ZIEGLER and MÖRS 2000). On the other hand, it also resembles the size of the diaphysis in *Talpa minuta* (Talpinae), a species known from many European localities, ranging from MN3 to MN9. The range of size variation of the diaphysis in *T. minuta* from younger localities [e.g. at Sansan in France (MN6), Petersbuch 6, 10, 18, 31, 48 in Germany (MN7+8)] is 2.26-2.95 mm (ZIEGLER 2003). Also morphological features, although very limited, indicate its belonging to Talpinae rather than to the Desmaninae. Therefore, it is tentatively assigned to *T. minuta*, as the presence of this species is already indicated by the M<sup>2</sup> described above.

Talpini gen. et sp. indet.

**M a t e r i a l.** Bełchatów C. One fragment of humerus (sin.), (No. MF/2316), Fig. 3A.

Minimum number of individuals = 1.

**D e s c r i p t i o n** of the material. The humerus is broken on both its proximal and distal side. On the dorsal side the top of the pectoral tubercle (situated in mid-shaft position) is present. The proximal epiphysis is entirely damaged. On the distal epiphysis the olecranon fossa, supratrochlear fossa and a part of the ectepicondyle and entepicondyle are preserved. The trochlea is rather broad.

**M e a s u r e m e n t.** Diameter of the shaft (WD – width of the diaphysis) = 2.06 mm.

**S y s t e m a t i c p o s i t i o n.** The only one, strongly damaged humerus practically makes impossible any generic and specific identification. The short and compact shaft (diaphysis) indicates, however, fossorial adaptation of this mole, typical for the representatives of the tribe Talpini or possibly of *Desmanodon* (Talpidae incertae sedis). On the other hand, its size is very small, smaller than in *Desmanodon* and in the smallest representative of the Talpini, *Talpa minuta* BLAINVILLE, 1838, both living in Europe in the Early and Middle Miocene. ZIEGLER (1985) cited the width (breadth) of the diaphysis of *D. antiquus*, a new species, described from Germany. It equals 2.40-2.90 mm (n=3). In French and German localities, where humeri of *T. minuta* are present, the width of the diaphysis varies from 2.26 to 2.95 mm. Those specimens are dated from MN2 and MN5-MN7+8 (BAUDELLOT 1972, ZIEGLER 1990, 2000, 2003). The oldest specimens of *T. minuta* from Budenheim/Hessler (MN2a) are as great as the younger ones (2.6-2.8, n=3), so there is no size enlargement with geological age.

The other representatives of Talpidae of the Early Miocene of Europe were also larger than the form from Bełchatów C, with the exception of the much smaller *Desmanella engesseri* ZIEGLER, 1985 (Urosilinae) (WD = 1.30-1.55, n = 6; ZIEGLER 1985) and *Myxomygale hutchisoni* (ZIEGLER, 1985) (Talpinae) (WD = 1.95-2.25, n = 9; ZIEGLER 1985). The dimension of diaphysis from Bełchatów C ideally fall within the range of variation of the last species. However, the diaphysis of Urotrichini moles, where *M. hutchisoni* belongs, seems to be longer and more slender.

## Tribe Urotrichini DOBSON, 1883

Genus "*Scaptonyx*" MILNE-EDWARDS, 1872"*Scaptonyx*" cf. *edwardsi* GAILLARD, 1899Material. Bełchatów B. One M<sup>3</sup> dext., (No. MF/2320), Fig. 2 B.

Minimum number of individuals = 1.

Description of the material. The lingual side of the M<sup>3</sup> is rather wide and its conules are very weak. The worn mesostyle was most probably confluent (or only superficially notched). The parastyle is straight, not bent anteriorly. The para- and metacingula are lacking.

Measurements. M<sup>3</sup> – L(max.) = 1.00 mm, W(max.) = 1.39 mm.

Systematic position. The size of the Bełchatów B M<sup>3</sup> suggests that it belongs to either *Talpa minuta* or "*Scaptonyx*" *edwardsi*. The detailed comparison of dimensions of these three forms indicates that it fits better to "*Scaptonyx*". It lies in the range of variation of *Scaptonyx* cf. *edwardsi* from Rembach (MN4) and Puttenham (MN5) (ZIEGLER 1985) as well as from Forsthart (ZIEGLER and FAHLBUSCH 1986), all in Germany. As to its morphology, it is also more similar to the last species. In relation to M<sup>3</sup> of *T. minuta* it has its lingual side wider with better accentuated cusps and a straight parastyle, which is slightly bent in *T. minuta*. As the material is so limited and the tooth worn, it is only tentatively identified as "*S.*" cf. *edwardsi*.

## Urosilinae DOBSON, 1883

Genus *Desmanella* ENGESSER, 1972*Desmanella* cf. *engesseri* ZIEGLER, 1985Material. Bełchatów C. 1 M<sub>3</sub> sin., (No. MF/2315), Fig. 2A.

Minimum number of individuals = 1.

Description of the material. The tooth is wide and its talonid a little reduced. The precingulid is wide, the ectocingulid a little narrower, and it forms a clear denticle in front of the hypoflexid. The postcingulid is weak and the entocingulid lacking. The oblique cristid extends lingually to half the height of the metaconid.

Measurements. M<sub>3</sub> – L max. = 1.29 mm, W max. = 0.76 mm.

Table IV

Dimensions (in mm) of M<sub>3</sub> in *D. engesseri* from several Early Miocene localities of Europe

			ZIEGLER (1985)	ZIEGLER and FAHLBUSCH (1986)	ZIEGLER (1998a)
		Bełchatów C (MN4)	Petersbuch 2 (MN4) <i>D. engesseri</i>	Forshart (MN4) <i>D. engesseri</i>	Obersdorf 4 (MN4) <i>D. aff. engesseri</i>
M <sub>3</sub>	L	1.29	1.10	1.15	1.19-1.24-1.28 (n=4)
	W	0.76	0.74	0.90	0.78-0.80-0.83 (n=4)

**S y s t e m a t i c p o s i t i o n.** This wide, short and low-crowned tooth of a talpid, which cusps point lingually and talonid is narrower than trigonid, represents the third lower molar and belongs to one of the *Desmanella* species. This genus contains a dozen or so species described from Turkish and European localities and dated from the Late Oligocene to the Late Pliocene. In Europe, the species from the Late Oligocene (Herrlingen 8, MP28; Herrlingen 9, MP29; Eggingen-Mittelhart 1, MP30), the Oligocene/Miocene boundary (Eggingen-Mittelhart 2, MN30/MN1) as well as from the beginning of the Miocene (Ulm-Westangente, MN2) derived from Germany. They are considered by ZIEGLER (1990, 1998b) and VAN DEN HOEK OSTENDE (1989) as new ones, but because of the paucity of the material they have got no specific names, so far. Beginning with the MN3, *D. engesseri* and the forms related to it appeared. *D. engesseri* was described by ZIEGLER (1985) from Petersbuch 2 in Germany, locality dated from MN4. In the same paper ZIEGLER also listed it from other German localities such as Erkertschofen 2, Rauscheröd 1b and Rembach (all MN4). It was also cited from Forsthart (MN4, ZIEGLER and FAHLBUSCH 1986) and as *D. aff.* (or cf.) *engesseri* from Stubersheim 3 (MN3b, ZIEGLER 1990) in Germany, Obersdorf 4 in Austria (MN4, ZIEGLER 1998a), and Rebstock-Andelfingen (MN4, BOLLIGER 1992) in Switzerland. The second species of *Desmanella* described from the Early Miocene (MN4) of Europe was *D. fejfari* GIBERT, 1974 from Rubielos de Mora in Spain. In 1980 ENGESSER considered it a synonym of a talpid belonging also to Uropsilinae, *Asthenoscapter meini* HUTCHISON, 1975. Yet, in his list of the Miocene Talpidae published by ZIEGLER in 1999 both forms are placed separately again (*Asthenoscapter* in Desmaninae and *Desmanella* in Talpinae incertae sedis).

The tooth from Bełchatów C is most similar to *Desmanella aff. engesseri* described by ZIEGLER (1998a) from Obersdorf 4, a locality of the same age. Its size also lies within the range of variation of the last mentioned form.

*Desmanella engesseri* ZIEGLER, 1985

**M a t e r i a l.** Bełchatów B. One M<sup>1</sup> dext., (No. MF/2321), Fig. 2D.

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.** In M<sup>1</sup> the mesostyle is only slightly divided. The protoconule and metaconule are perfectly individualized. The prepraconule crista is continuous with paracingulum, which joins a distinct and protruding parastyle. The postmetaconule crista joins the fine metacingulum which enlarges in front of the metastyle.

**M e a s u r e m e n t s.** M<sup>1</sup> – L max. = 1.84 mm, W max. = 1.44 mm.

**S y s t e m a t i c p o s i t i o n.** Upper mole teeth similar to M<sup>1</sup> from Bełchatów B (characterized by divided mesostyle and a strongly developed lingual part, otherwise with very well individualized protoconule, protone, and metaconule) have representatives in the subfamily Desmaninae and among the genus *Desmanella* (Uropsilinae). The upper M<sup>1</sup> from Bełchatów B with poorly divided mesostyle and strongly individualized lingual cusps is similar to this tooth in *Desmanella*. The Desmaninae moles present in the Early and the Middle Miocene are: *Mygalea anti-qua*, *M. jaegeri*, and *M. magna* (see p. 76). Contrary to the tooth from Bełchatów B, M<sup>1</sup> of *Mygalea* has deeply divided mesostyle. Besides, it is larger, and its lingual cusps, especially protoconule, are much less individualized.

The comparison of the Bełchatów B tooth with specimens of different forms of *Desmanella* from the Early and Middle Miocene of Europe indicates its membership in *D. engesseri*. Its morphology seems to be identical with the last species and its size lies in the range of its variation (M<sup>1</sup> – L max. = 1.80-2.15 mm, W max. = 1.35-1.50 mm, n = 6; acc. ZIEGLER 1985, from diagram).

*Desmanella cf. stehlini* ENGESSER, 1972

**M a t e r i a l.** Bełchatów A. One P<sup>4</sup> dext., three M<sup>1</sup> dext. with a broken metastyle and one M<sup>1</sup> dext. with a broken lingual part, one M<sup>2</sup> dext. with a broken antero-buccal parts, two M<sup>3</sup> dext.,

both with broken antero-buccal part, three ?I<sub>2</sub> sin., two ?I<sub>2</sub>, dext., one M<sub>1</sub>, sin., two M<sub>2</sub> sin., two M<sub>2</sub>, dext., one M<sub>3</sub> sin., one M<sub>3</sub> dext, and seven talonids of M<sub>1</sub> or M<sub>2</sub> or M<sub>1</sub> and M<sub>2</sub> dext., (No. MF/2323), Fig. 4A-H.

Minimum number of individuals = 4 (see above).

**Description of the material.** The upper P<sup>4</sup> is slightly damaged in its anterior side. It is characterized by the presence of a large paracone and a small protocone. The paracone is conical in shape except for the posterior side, which has a sharp posterocrista. The anterocrista is absent. The conical protocone is not connected to the paracone. A cingulum runs around the base of the crown. It is rather narrow and only slightly larger in the middle of the labial side.

All M<sup>1</sup> are damaged in different degrees. Three of four have broken metastyles, in the fourth the metastyle is elongated. The moderately developed mesostyle is slightly divided. The parastyle is conical and well developed, not connected with the paracone. The metacone is larger than the paracone and situated more lingually. The protocone is large and has the antero-lingual position (it is situated in the antero-lingual corner of the tooth). The protoconule, protocone and metaconule are very well individualized and connected by a ridge. The buccal cingulum is present except on the mesostyle. It forms a little cusp behind the paracone. The lingual cingulum is present except on the protocone. Fragments of para- and metacingulum are also visible.

There is only a lingual half of the M<sup>2</sup> and it is deeply worn. Like in M<sup>1</sup>, the lingual cusps were well developed, but the protocone was situated more lingually and almost in the middle of the lingual side, which makes the outline of the lingual side of the crown convex, not straight as in M<sup>1</sup>.

M<sup>3</sup> has a well-developed paracone and metacone. The mesostyle was probably not only slightly divided. As in M<sup>2</sup>, the protocone is well individualized and situated at the lingual side of the tooth. The protoconule and metaconule are smaller and less developed. The metaconule is separated from the protocone by a wide valley. The paracingulum is present.

?I<sub>2</sub> has a somewhat triangular cross-section tapering to a sharp cutting edge. The buccal side of the crown is convex, the lingual one is concave. The postero-buccal cingulum is present and forms a small distinct bulge at the basis of the posterocrista. The lingual cingulum is narrow. The strong root is flattened and has an elliptical cross-section.

All lower molars are wide and their cusps are inclined lingually. In the M<sub>1</sub> the talonid is wider than the trigonid, the entostylid is well developed, and the oblique cristid ends halfway the protoconid-metaconid crest. The anterior cingulum is wide but it narrows towards the antero-lingual corner of the tooth. The parastylid is absent. The buccal and posterior cingulum are narrow. The latter runs to the base of the entostylid. The lingual cingulum is present only between the paraconid and the metaconid.

M<sub>2</sub> has the trigonid and talonid more or less of equal size. The parastylid and entostylid are present. The oblique cristid ends just below the top of the metaconid or a little lower. The anterior cingulum is wide throughout its entire length, the buccal, posterior and anterior ones are as in M<sub>1</sub>. All other characters are similar to those of M<sub>1</sub>.

M<sub>3</sub> has the trigonid longer and wider than the talonid. Its anterior cingulum is wide and the parastylid present. The posterior cingulum and the entostylid are absent. All other characters are similar to those in M<sub>1</sub> and M<sub>2</sub>.

As concerns the seven talonids, one of them can belong to M<sub>1</sub>, because its oblique cristid ends in the middle of the hypoconid/metaconid crest (trigonid/talonid wall), two other can belong to M<sub>2</sub>, because the oblique cristid continues to the top of the metaconid, and four of them have their trigonid/talonid wall broken, so it is impossible to assign them to one of two molars (M<sub>1</sub> or M<sub>2</sub>).

**Measurements.** See Table V.

Table V

Dimensions of upper and lower teeth (in mm) of *D. cf. stehlini* from Bełchatów A

No. of specimen	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P <sup>4</sup>	L	1.25*	–	–	–	–	–	–	–	–	–	–	–	–	–
	W	1.17	–	–	–	–	–	–	–	–	–	–	–	–	–
M <sup>3</sup>	L	–	0.96	0.90	–	–	–	–	–	–	–	–	–	–	–
	W	–	1.14	–	–	–	–	–	–	–	–	–	–	–	–
?I <sub>2</sub>	L	–	–	–	0.68	0.71	0.81	0.85	0.80	–	–	–	–	–	–
	W	–	–	–	0.52	0.53	0.54	0.54	0.50	–	–	–	–	–	–
M <sub>1</sub>	L	–	–	–	–	–	–	–	–	1.40	–	–	–	–	–
	W	–	–	–	–	–	–	–	–	1.08	–	–	–	–	–
M <sub>2</sub>	L	–	–	–	–	–	–	–	–	–	1.56	1.59	1.57	1.51	–
	W	–	–	–	–	–	–	–	–	–	1.05	1.07	1.06	0.98	–
M <sub>3</sub>	L	–	–	–	–	–	–	–	–	–	–	–	–	1.32	1.33
	W	–	–	–	–	–	–	–	–	–	–	–	–	0.85	0.82

\* – a little damaged.

**Systematic position.** As mentioned above (p. 81) such characters as elongated metastyle of M<sup>1</sup>, slightly divided mesostyle, and strongly developed lingual part of upper molars, as well as the short and wide lower molars with cusp inclined lingually indicate that the specimens from Bełchatów A belong to the genus *Desmanella*.

So far, in the Middle and Late Miocene four species of this genus have been found in Europe. *D. stehlini* ENGESSER, 1972 was described from Anwil in Switzerland, a locality dated from MN 8. It was also cited from other Swiss locality, Le Locle Sous Le Stand C-13 (MN 7+8, KÄLIN 1993), French locality Montredon (MN10, CROCHET and GREEN 1982), and German localities Petersbuch 6, 18, 31 (MN7+8, ZIEGLER 2003) as *D. aff. or cf. stehlini*.

*D. crusafonti* RÜMKE, 1974 was found for the first time at Conclud in Spain (MN12) and then it was also listed from another Spanish locality Pedregueras 2A (Early Vallesian, DE JONG 1988) as well as from Kohfidisch in Austria (MN11, BACHMAYER and WILSON 1985) as cf. *Desmanella crusafonti*.

*D. dubia* RÜMKE, 1976 was described from Pikermi in Greece (MN12) and then found at Vendargues and Terrats (MN14, CROCHET 1986) in France and at Maramena in Greece (MN13/MN14, DOUKAS et al. 1995).

The last species, *D. rietscheli* described by STORCH and DAHLMANN (2000) is only known from its type locality, Dorn-Dürkheim (MN11) in Germany.

Table VI

Dimensions (in mm) of some upper and lower teeth of *Desmanella* species from several Middle/Late and Late Miocene localities of Europe

	ENGESSER (1972)	CROCHET and GREEN (1982)	KÄLIN (1993)	ZIEGLER (2003)	RÜMKE (1974)	DE JONG (1988)	RÜMKE (1967)	STORCH and DAHLMANN (2000)
	Anwil MN8	Montredon MN10	Le Locle Sous Le Stand C-13 MN7+8	Petersbuch 6, 18, 31 MN7+8	Concud MN12	Pedregueras 2A Early Vallesian	Pikermi MN12	Dorn-Dürkheim MN11
	<i>D.</i> <i>stehlini</i>	<i>D.</i> cf. <i>stehlini</i>	<i>D.</i> aff. <i>stehlini</i>	<i>D.</i> cf. <i>stehlini</i>	<i>D. crusafonti</i>		<i>D.</i> <i>dubia</i>	<i>D.</i> <i>rietscheli</i>
P <sup>4</sup>	L		1.40		1.68	1.57	1.26	1.20-1.28
								x = 1.24, n = 3
W			1.32		1.51	1.47	1.10	1.12-1.16
								x = 1.14, n = 4
M <sup>3</sup>	L	0.96-1.03					1.03	
		x = 0.99, n = 2						
W		1.09-1.33					1.41	
		x = 1.21, n = 2						
M <sub>1</sub>	L	1.52	1.40-1.60	1.40	1.57	1.80	1.61	1.44-1.52
			x = 1.47, n = 3					x = 1.48, n = 5
W		1.16	1.03-1.07	1.12	1.07	1.32	1.18	1.28-1.36
			x = 1.05, n = 3				x = 1.11, n = 2	x = 1.31, n = 3
M <sub>2</sub>	L	1.54	1.57-1.70		1.61	1.86	1.84	1.64-1.70
			x = 1.64, n = 5				x = 1.71, n = 2	x = 1.67, n = 2
W		1.32	0.97-1.08		1.00	1.22	1.27	1.20
			x = 1.02, n = 5				x = 1.11, n = 2	
M <sub>3</sub>	L		1.26-1.38		1.26		1.28-1.37	1.20-1.26
			x = 1.32, n = 2				x = 1.32, n = 2	x = 1.23, n = 3
W			0.83-0.87		0.76		0.68-0.70	0.88 - 1.00
			x = 0.85, n = 2				x = 0.69, n = 2	x = 0.95, n = 3

*D. quinquecuspidata* was described by MAYR and FAHLBUSCH (1975) from Hammerschmiede (MN9), also in Germany, but its inclusion in the genus *Desmanella* has lately been questioned by RÜMKE (1985), ENGESSER and ZIEGLER (1996).

As concerns the morphology and dimensions, *D. dubia* has P<sup>4</sup> and M<sub>1</sub> of similar size as these teeth in Bełchatów A, but the other teeth are bigger or have different proportions. Besides, in comparison to Bełchatów A the upper molars of *D. dubia* have undivided mesostyles, small proto-

nules almost completely incorporated into the protocones and they lack the lingual cingulum in lower molars, present in Bełchatów B teeth between the paraconid and the metaconid.

*D. crusafonti* is larger (see Table VI) than the Bełchatów A specimens, and its metastyle in  $M^1$  is more elongated posteriorly, causing a concave posterior margin of tooth (=posterior emargination). Besides, its lower molars have no continuous buccal cingulum and  $M_1$  has distinct parastyloid lacking in the tooth from Bełchatów A.

The size of  $P^4$  from Bełchatów A lies in the range of variation of  $P^4$  in *D. rietscheli* but the lower molar,  $M_2$ , is only slightly larger than  $M_1$ , while in *D. rietscheli* the difference between both teeth is large, because  $M_2$  is much longer than  $M_1$ . Besides, the  $P^4$  from the Bełchatów A has interrupted buccal and lingual cingula, the metastyle of  $M^1$  more elongated, and the buccal cingulum also interrupted at the base of the hypoconid. As concerns the dimensions of a lower incisor (probably  $I_2$ ) present in Bełchatów A, they have never been cited in the literature.

In general, the Bełchatów A teeth are most similar in size to teeth of *D. cf. stehlini* from Montredon in France and they are a little smaller than those from the type locality Anwil. In spite of their bad preservation, the morphological characters also show resemblance to *D. stehlini*. In upper molars the metastyle of  $M^1$  is not so elongated, the mesostyle is only slightly divided, the buccal cingulum interrupted in the middle of the teeth and it ends with a small cusp behind the paracone. Also the lower  $M_1$  has no paracingulid (its anterior cingulum narrows in the direction of the lingual side), and  $M_2$  is only slightly longer than  $M_1$ . Besides, specimens from Bełchatów A are also the nearest of age of *D. stehlini*, which has been known, so far, as the Late Astracian and Vallesian (MN7+8 - MN10) (ZIEGLER 1999).

As small differences (lack of small cingular cusp between the protocone and metaconule on the lingual side of the upper molars, and the talonids of the lower molars are not so short in relation to the trigonids) between Bełchatów A specimens and *D. stehlini* are present, the remains from Bełchatów A are classified as *D. cf. stehlini*.

#### Talpidae gen. et sp. indet.

**M a t e r i a l.** Bełchatów A. One  $M^3$  sin. (No. MF/2324).

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.** The upper third molar is slightly damaged in its antero-buccal corner. Its paracone is the highest cusp and it is shifted lingually. The protoconule is big and only slightly smaller than the protocone. On the lingual side both cusps are separated by the clear depression. The metaconule is very small, shifted buccally, situated near the basis of the metacone. The worn mesostyle was probably undivided. Neither para- nor metacingulum is present.

**M e a s u r e m e n t s.**  $M^3$  Lmax. – 1.34\* mm, Wmax. – 1.60\* mm (\* – slightly damaged).

**S y s t e m a t i c p o s i t i o n.** The tooth massiveness indicates that it belongs to one of the Desmaninae or *Desmanodon* species. Yet its size, proportions and morphology (undivided mesostyle, hardly visible metaconule, para-, meta-, as well as buccal and lingual cingula lacking) do not agree with  $M^3$  characters of the above mentioned Miocene forms. As concerns the Talpinae it also differs from so far described taxa of the Miocene period with the exception of the  $M^3$  of *Myxomygale engesseri* described by DOUKAS (1986) from the Early Miocene (MN4) of Greece locality Aliveri. Like the *M. engesseri*, the tooth from Bełchatów A is characterized by small metaconule, undivided mesostyle and the lack of anterior and posterior cingula. However, it is much bigger, and what is much important, not so slender as all Urotrichini teeth. It is most probable that this tooth represents a new form of the Miocene mole but more material is needed to decide about it.

III. FAUNA OF ERINACEIDAE AND TALPIDAE  
IN LOCALITIES OF BĘŁCHATÓW

Remains of the Miocene land mammals in the north-eastern part of Europe where geological conditions were unfavourable for the preservation (rare basins with Neogene sediments, erosion during the Quaternary glaciations) are scarce. It concerns also moles and hedgehogs found in Polish localities at Bełchatów where only few specimens and taxa were found (see Table VII).

Table VII

The list of moles and hedgehogs identified in the material from Bełchatów C, B and A

Species	Localities		
	Bełchatów		
	C	B	A
ERINACEIDAE			
<i>Lanthanotherium</i> aff. <i>sansaniense</i>	–	+	–
TALPIDAE			
Talpidae gen. et sp. indet.	–		+
Desmaninae			
<i>Mygalea</i> cf. <i>antiqua</i>	–	+	–
Talpinae			
<i>Talpa minuta</i>	–	+	–
? <i>Talpa minuta</i>	–	–	+
Talpini gen. et sp. indet.	+	–	–
“ <i>Scaptonyx</i> ” cf. <i>edwardsi</i>	–	+	–
Uropsilinae			
<i>Desmanella</i> cf. <i>engesseri</i>	+	–	–
<i>Desmanella engesseri</i>	–	+	–
<i>Desmanella</i> cf. <i>stehlini</i>	–	–	+

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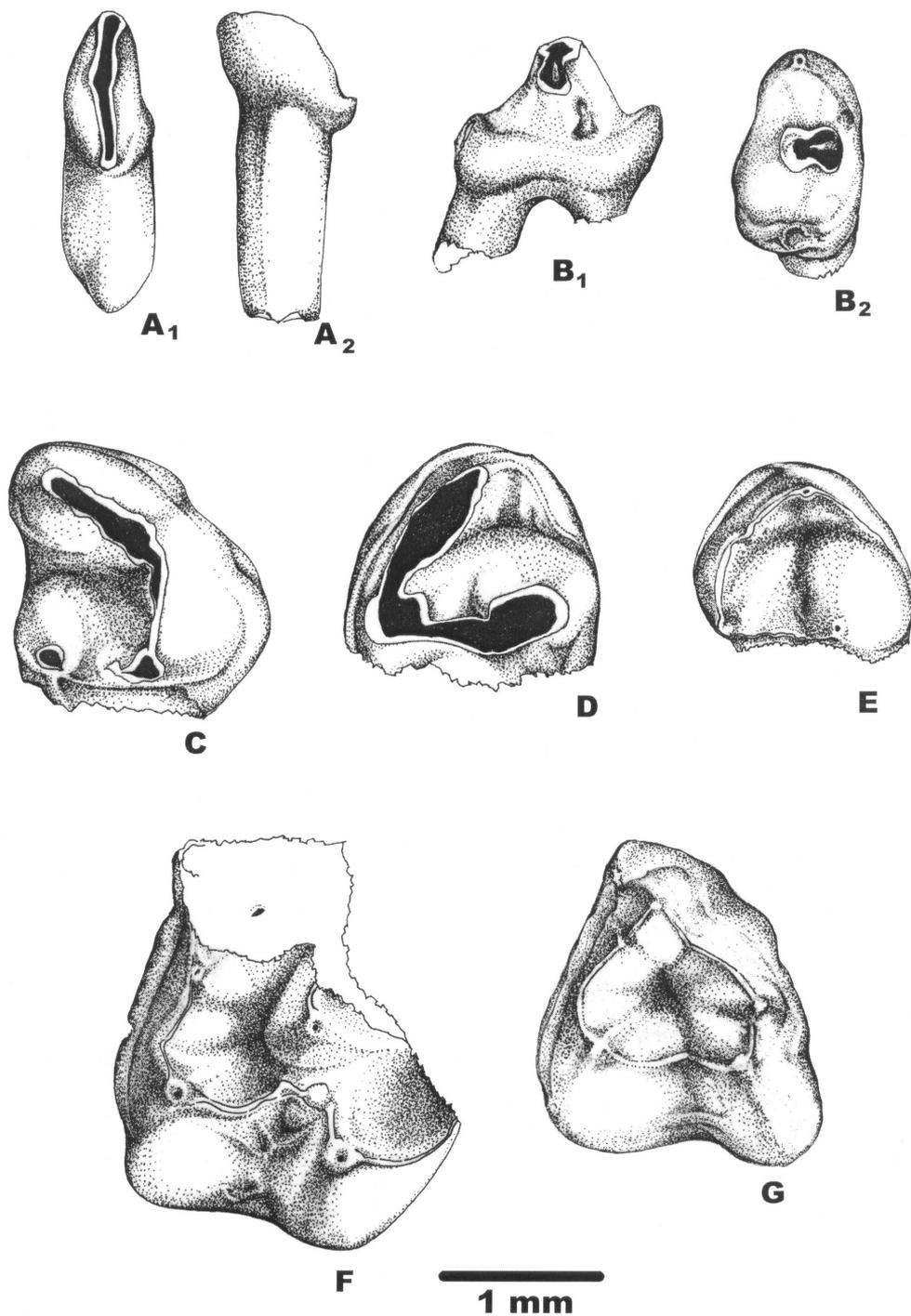


Fig. 1. *Lanthanotherium* aff. *sansaniense* from Bełchatów B (No. MF/2317). A<sub>1</sub> – ?I<sub>2</sub> sin., A<sub>2</sub> – the same specimen (buccal view); B<sub>1</sub> – P<sub>3</sub> dext. (buccal view), B<sub>2</sub> the same specimen (occlusal view); C – trigonid of M<sub>1</sub> dext.; D – trigonid of M<sub>2</sub> sin.; E – trigonid of M<sub>3</sub> dext.; F – fragment of M<sup>1</sup> sin.; G – M<sup>2</sup> dext.

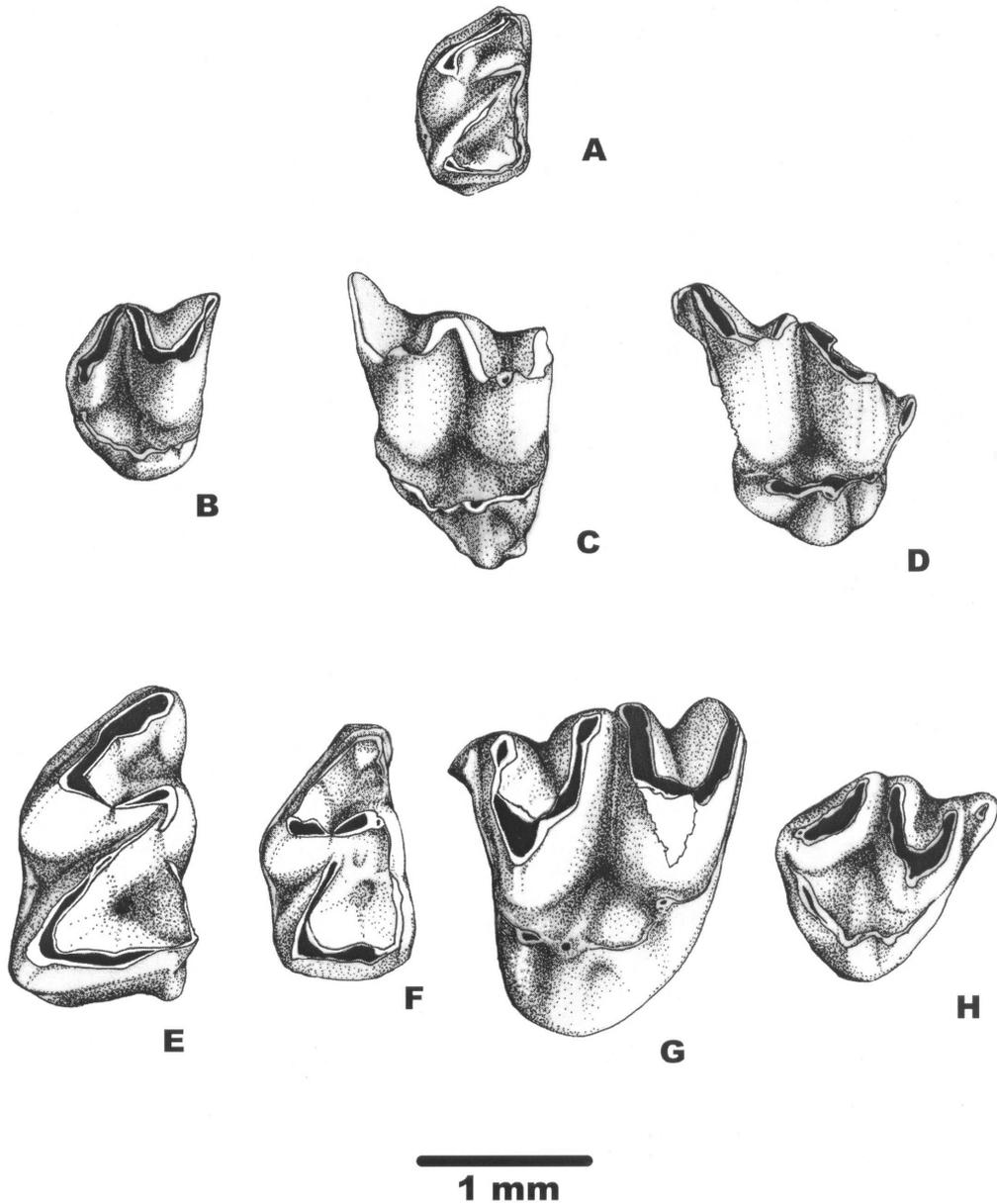


Fig. 2. *Desmanella* cf. *engesseri* from Belchatów C (No. MF/2315). A –  $M_3$  sin.; “*Scaptonyx*” cf. *edwardsi* from Belchatów B (No. MF. 2320). B –  $M_3$  dext.; *Talpa minuta* from Belchatów B (No. MF/2319). C –  $M_2$  dext.; *Desmanella engesseri* from Belchatów B (no. MF/2321). D –  $M^1$  dext.; *Mygalea* cf. *antiqua* from Belchatów B (No. MF/ 2318). E –  $M_2$  sin., F –  $M_3$  sin., G –  $M^2$  sin., H –  $M^3$  dext.

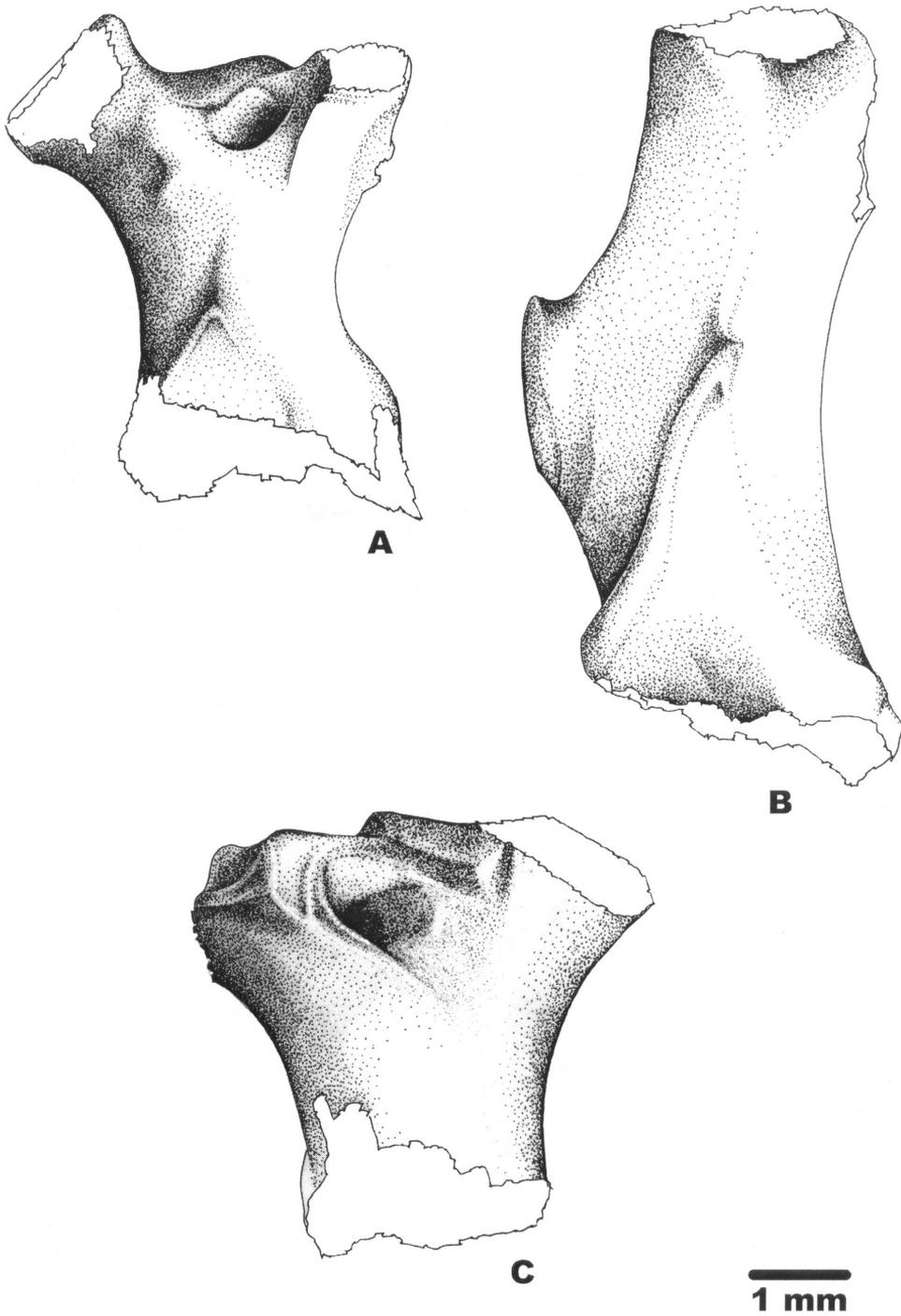


Fig. 3. Talpini gen. et sp. indet. from Belchatów C (No. MF/2316). A – fragment of humerus sin.; *Mygalea* cf. *antiqua* from Belchatów B (No. MF/2318). B – fragment of humerus dext.; *Talpa minuta* from Belchatów A (No. MF/2322). C – fragment of humerus dext.

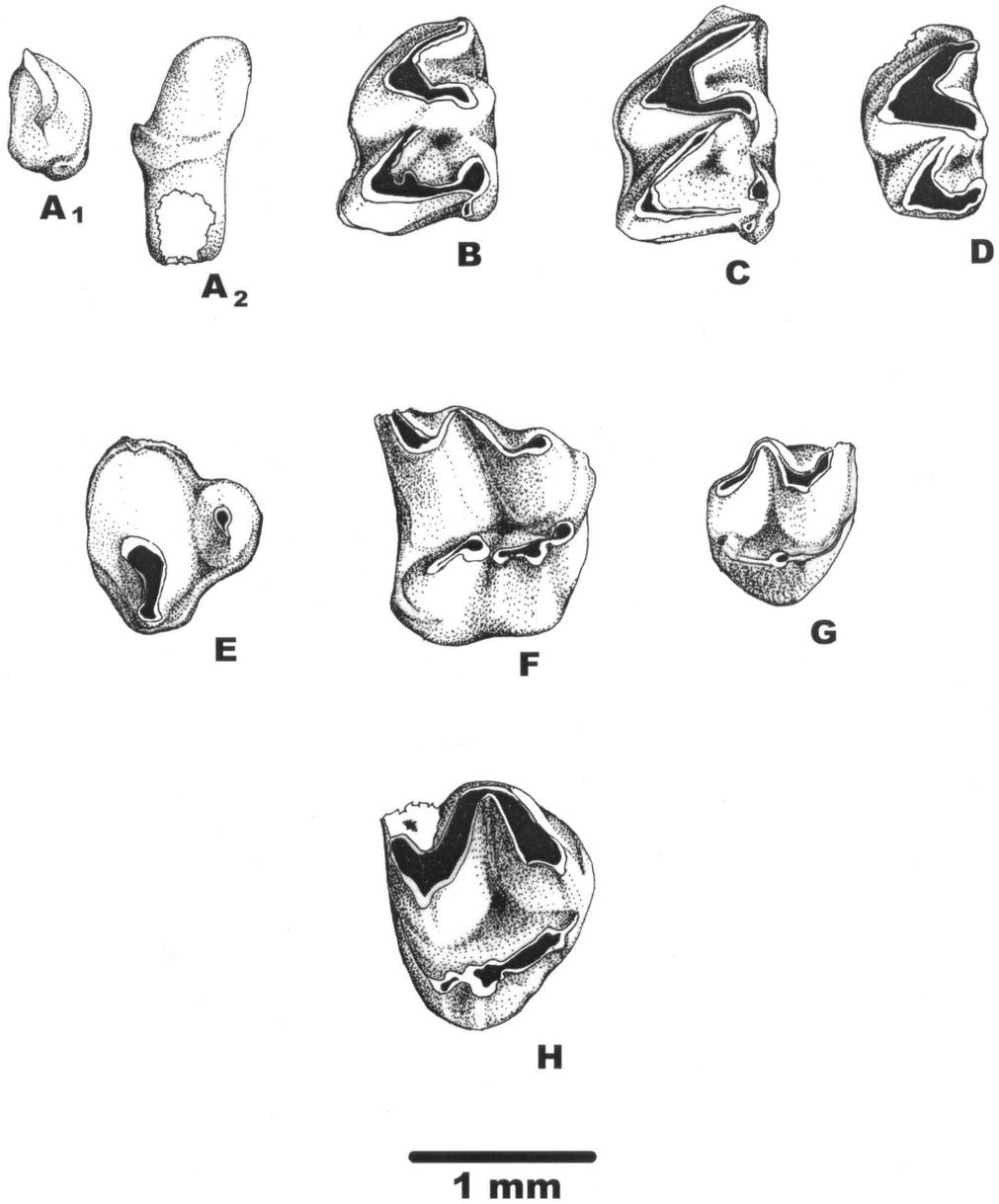


Fig. 4. *Desmanella* cf. *stehlini* from Bełchatów A (No. MF/2323). A<sub>1</sub> – ?I<sub>2</sub> dext., A<sub>2</sub> – the same specimen (buccal view), B – M<sub>1</sub> sin., C – M<sub>2</sub> sin., D – M<sub>3</sub> sin., E – P<sup>4</sup> dext., F – M<sup>1</sup> dext., G – M<sup>3</sup> dext.; Talpidae gen. et sp. indet. from Bełchatów A (No. MF/2324). H – M<sup>3</sup> sin.