

## ***Microtocricetus molassicus* FAHLBUSCH and MAYR, 1975 (Rodentia, Mammalia) from the Miocene of Bełchatów (Poland).**

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Abstract. Isolated molars of *Microtocricetus molassicus* have been found in lacustrine carbonate sediments in the upper part of the profile in the brown-coal mine at Bełchatów (Bełchatów – A). So far this species has been known from several Early Vallesian (MN 9) fossil localities in central and eastern Europe. *Sarmatomys podolicus* TOPACHEVSKY and SKORIK, 1988 is a synonym of *M. molassicus*. The discovery of *Microtocricetus molassicus* makes it possible to determine the time of the end of brown coal sedimentation at Bełchatów.

Key-words: fossil mammals, *Rodentia*, *Microtocricetus*, Miocene, Poland.

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### I. INTRODUCTION

The brown coal mine at Bełchatów in central Poland contains several layers of limnic carbonate sediments intercalated between coal seams. They contain numerous shells of molluscs and remains of small mammals (STWORZEWICZ, SZYNKIEWICZ 1989, STUHLIK et al. 1990). In the uppermost layers of Tertiary sediments at Bełchatów, known as "Bełchatów – A" 20 molars belonging to *Microtocricetus molassicus* FAHLBUSCH and MAYR, 1975 have been found among numerous teeth of small mammals.

This species was first described from the fossil localities of Marktl and Hammerschmiede in Bavaria (FAHLBUSCH, MAYR 1975). Two teeth of *Microtocricetus molassicus* have been later described from Götzendorf in Austria (BACHMAYER, WILSON 1984); more material was collected in this locality in following years (DAXNER-HÖCK, personal communication). TOPACHEVSKY and SKORIK (1988) discovered two teeth at Gritsev, in Chmielnicki Region in the Ukraine, in layers of Middle Sarmatian age which they identified as a new species, *Sarmatomys podolicus*. The characters of these specimens are, in my opinion, within the range of variability of the typical population of *Microtocricetus molassicus* from Hammerschmiede, especially when new, unpublished material from this

locality is taken into account. FEJFAR and HEINRICH (1989) and KORDOS (1991) listed *Microtocriceus molassicus* among the vertebrates from the locality Rudabanya in Hungary. WELLCOMME, AGUILAR and GINSBURG (1991) noted the presence of *Microtocriceus* sp. in Priay II, north-east of Lyon. It was represented there by one damaged molar.

*Microtocriceus molassicus* is therefore known so far from few localities of Europe and its knowledge is limited to a relatively small number of remains. The specimens from Bełchatów extend the known geographical range of the species and contribute to the knowledge of its variability. On the same time they make it possible to determine the geological age of the uppermost Tertiary layers at Bełchatów.

This paper is the first of a series of publications concerning the small mammal fauna of the Miocene of Bełchatów.

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

## II. SYSTEMATIC PART

### Family Cricetidae

#### Genus *Microtocriceus* FAHLBUSCH and MAYR, 1975

Synonym: *Sarmatomys* TOPACHEVSKI and SKORIK, 1988

#### *Microtocriceus molassicus* FAHLBUSCH and MAYR, 1975

Synonym: *Sarmatomys podolicus* TOPACHEVSKI and SKORIK, 1988

**Material.** Bełchatów – A. Isolated molars: 3 M<sub>1</sub> (one of them damaged), 4 M<sub>2</sub> (one damaged), 4 M<sub>3</sub>, 3 M<sub>1</sub><sup>1</sup>, 2 M<sub>2</sub><sup>2</sup>, 3 M<sub>3</sub><sup>3</sup> and several small fragments of molars (ISEZ MF/2133). At least 3 individuals are represented in the material.

**Description.** M<sub>1</sub>. One damaged right M<sub>1</sub> (MF/2133/1, Fig. 1) has a relatively high crown, two remaining ones, both left, are deeply worn. In specimen MF/2133/2 (Fig. 2) an enamel island is present in the middle of the anteroconid complex, in specimen MF/2133/3 (Fig. 3), notwithstanding the same height of the crown, the island is absent. The labial part of the anteroconid complex is less conspicuous in the specimens from Bełchatów than it is in most of the analogous teeth from Hammerschmiede.

M<sub>2</sub>. Four specimens represent different stages of wear. In only slightly worn specimen MF/2133/4 (Fig. 4) the crown is composed of 4 transversal, unconnected anticlinals. With

progressing wear the anticlinals become interconnected (MF/2133/5-6, Figs 5-6). These teeth do not differ from those belonging to the typical series from Bavaria.

M3. Four specimens are present (MF/2133/8 - 11). Specimen MF/2133/8 (Fig. 7) is nearly unworn, which makes it possible to measure the maximum height of the crown (1.22 mm). The crown - pattern is variable: in specimen MF/2133/9 (Fig. 8) anteroconid complex is separated from the successive anticlinal, in specimen MF/2133/10 (Fig. 9) these two elements are connected notwithstanding its less advanced stage of wear.

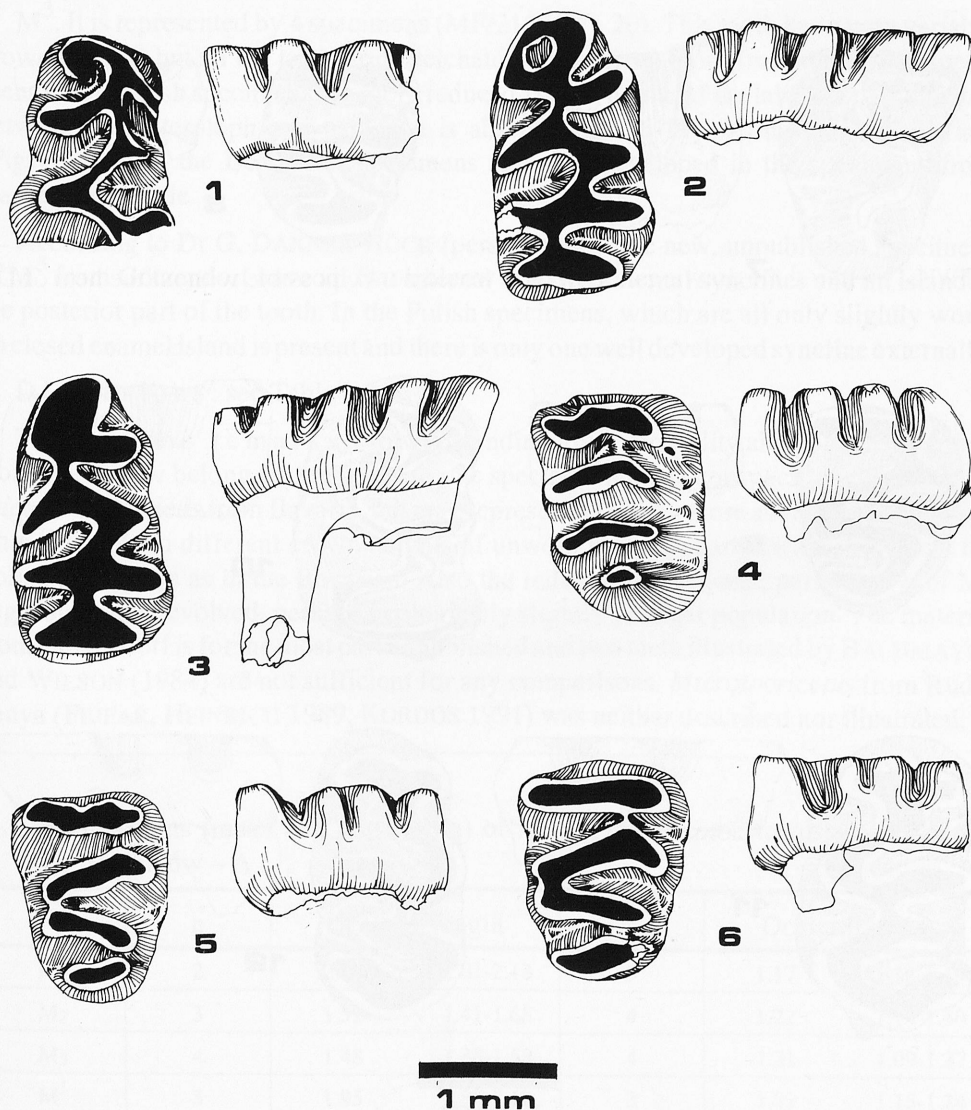


Fig. 1-6. *Microtocricetus molassicus*, Bełchatów - A. 1 - RM<sub>1</sub>, No 2133/1; 2 - LM<sub>1</sub>, No 2133/2; 3 - LM<sub>1</sub>, No 2133/3; 4 - RM<sub>2</sub>, No 2133/4; 5 - RM<sub>2</sub>, No 2133/5; 6 - RM<sub>2</sub>, No 2133/6.

I had an opportunity to compare my specimens with 15 M<sub>3</sub> (mainly unpublished) from Hammerschmiede. There are differences between these two samples. The ridge formed by the protoconid and mesolophid is nearly transversal in Bavarian specimens, it is more oblique in those from Poland. Variability is significant in both samples, but the Bełchatów material has higher crowns with shorter grinding surfaces.

M<sup>1</sup>. Two right and one left specimens in different stages of wear are present (MF/2133/12 – 14). In specimen MF/2133/12 (Fig. 10) there is an enamel island in the middle of the anterocone and in MF/2133/14 (Fig. 12) a concavity on the anterior border of the anterocone.

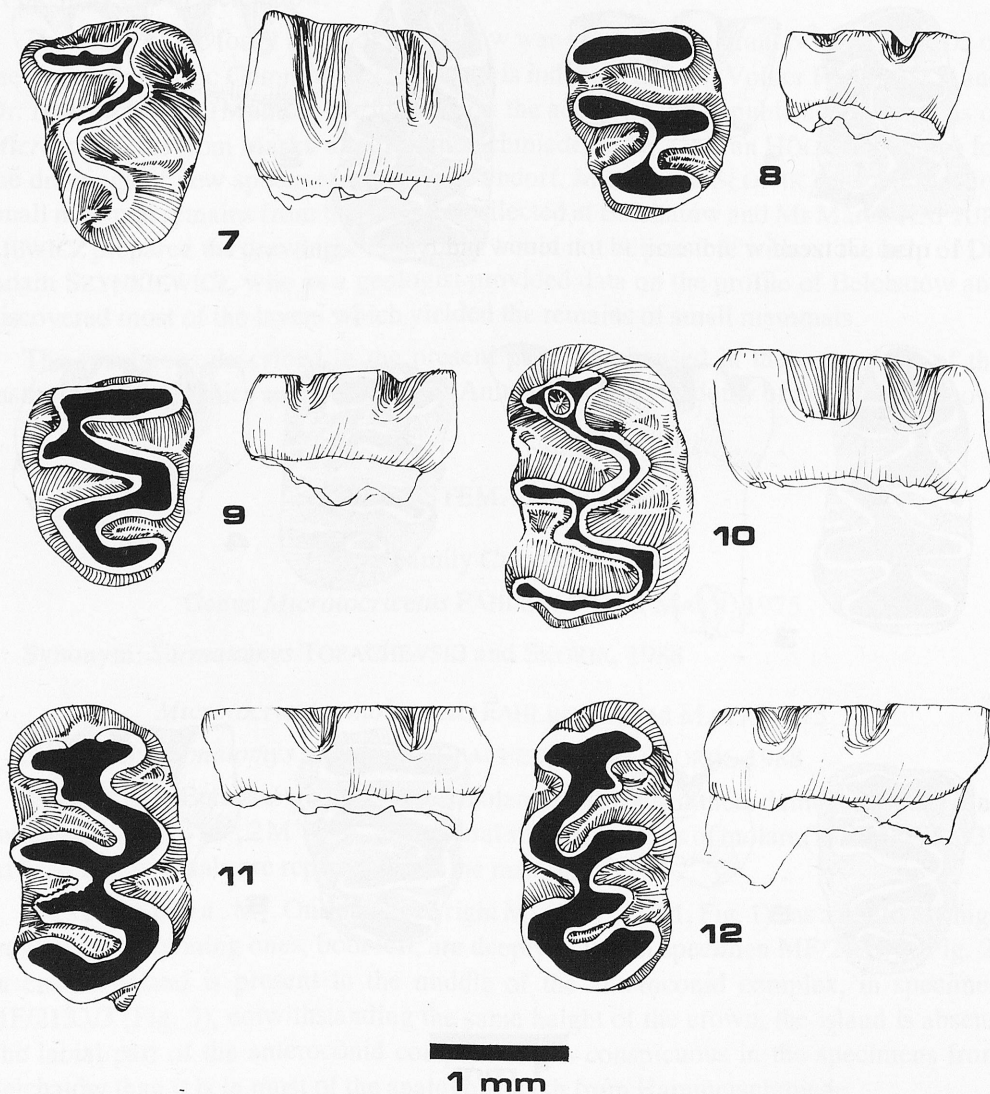


Fig. 7-12. *Microtocricetus molassicus*, Bełchatów – A. 7 – RM<sub>3</sub>, No 2133/8; 8 – LM<sub>3</sub>, No 2133/9; 9 – LM<sub>3</sub>, No 2133/10; 10 – RM<sup>1</sup>, No 2133/12; 11 – RM<sup>1</sup>, No 2133/13; 12 – LM<sup>1</sup>, No 2133/14.



In the unique illustrated specimen of  $M^1$  from Hammerschmiede (FAHLBUSCH, MAYR 1975, Fig. 9) the anterocone is undivided. Among the new, unpublished material from that locality (15 specimens) in five specimens the division of the anterocone is more or less evident and in one it is as strong as in the holotype of *Sarmatomys podolicus*.

On the ridge connecting the protocone and anterocone in two of the specimens from Bełchatów (MF/2133/13 - 14, Figs 11-12) there is a distinctly marked spur which is never so well developed in the specimens from Bavaria.

$M^2$ . Two specimens (MF/ 2133/15 - 16, Figs 13-14) not differing from those from Hammerschmiede and Götzendorf (BACHMAYER, WILSON 1984) are present.

$M^3$ . It is represented by 4 specimens (MF/2133/17 - 20). This tooth has a very variable crown-pattern, but all the teeth from Bełchatów differ from those from Bavaria (8 specimens). The Polish specimens are more reduced. The syncline of the labial border situated between the anteroloph and paracone is absent (Figs 16-17) or only slightly marked (Figs 15, 18) in the Bełchatów specimens and well developed in the specimens from Hammerschmiede.

According to Dr G. DAXNER-HÖCK (pers. comm.) five new, unpublished specimens of  $M^3$  from Götzendorf have all two internal and two external synclines and an island in the posterior part of the tooth. In the Polish specimens, which are all only slightly worn, no closed enamel island is present and there is only one well developed syncline externally.

Dimensions: see Table I.

**Taxonomic remarks.** Notwithstanding great variability all the teeth described from Bełchatów belong undoubtedly to one species. They are conspecific with *Microtocricetus molassicus* from Bavaria, but may represent a slightly more advanced population. This is visible in different crown heights of unworn molars, nearly twice as large in the Polish specimens as in the Bavarian. Also the reduction of  $M_3$  and, particularly, of  $M^3$  suggests a more evolved, perhaps geologically slightly younger population. The material from Götzendorf is for the most part unpublished and two teeth illustrated by BACHMAYER and WILSON (1984) are not sufficient for any comparisons. *Microtocricetus* from Rudabanya (FEJFAR, HEINRICH 1989, KORDOS 1991) was neither described nor illustrated.

Table I

Dimensions (mean and range, mm) of molars in *Microtocricetus molassicus* from Bełchatów - A

	n	Occlusal length		n	Occlusal width	
$M_1$	2	2.07	2.01-2.13	3	1.17	1.12-1.19
$M_2$	3	1.52	1.41-1.68	4	1.22	1.14-1.30
$M_3$	4	1.48	1.38-1.58	4	1.22	1.09-1.37
$M^1$	3	1.95	1.80-2.10	3	1.21	1.15-1.24
$M^2$	2	1.77	1.76-1.77	2	1.24	1.22-1.25
$M^3$	4	1.45	1.33-1.55	4	1.20	1.10-1.33

*Sarmatomys podolicus* TOPACHEVSKI and SKORIK, 1988 is represented only by one isolated  $M^1$  (holotype) and one  $M_1$  preserved in the mandible. In the number of roots and dimensions they do not differ from the specimens from Bavaria. The only character which is recognized by TOPACHEVSKI and SKORIK as justifying the description of a new species and genus, is the division of the anterocone in Ukrainian specimen. In the unique illustrated specimen from the original material of *Microtocricetus molassicus* the anterocone was undivided. Among the new specimens from Hammerschmiede and those from Bełchatów there are specimens with their anterocones either divided or undivided as well as with all

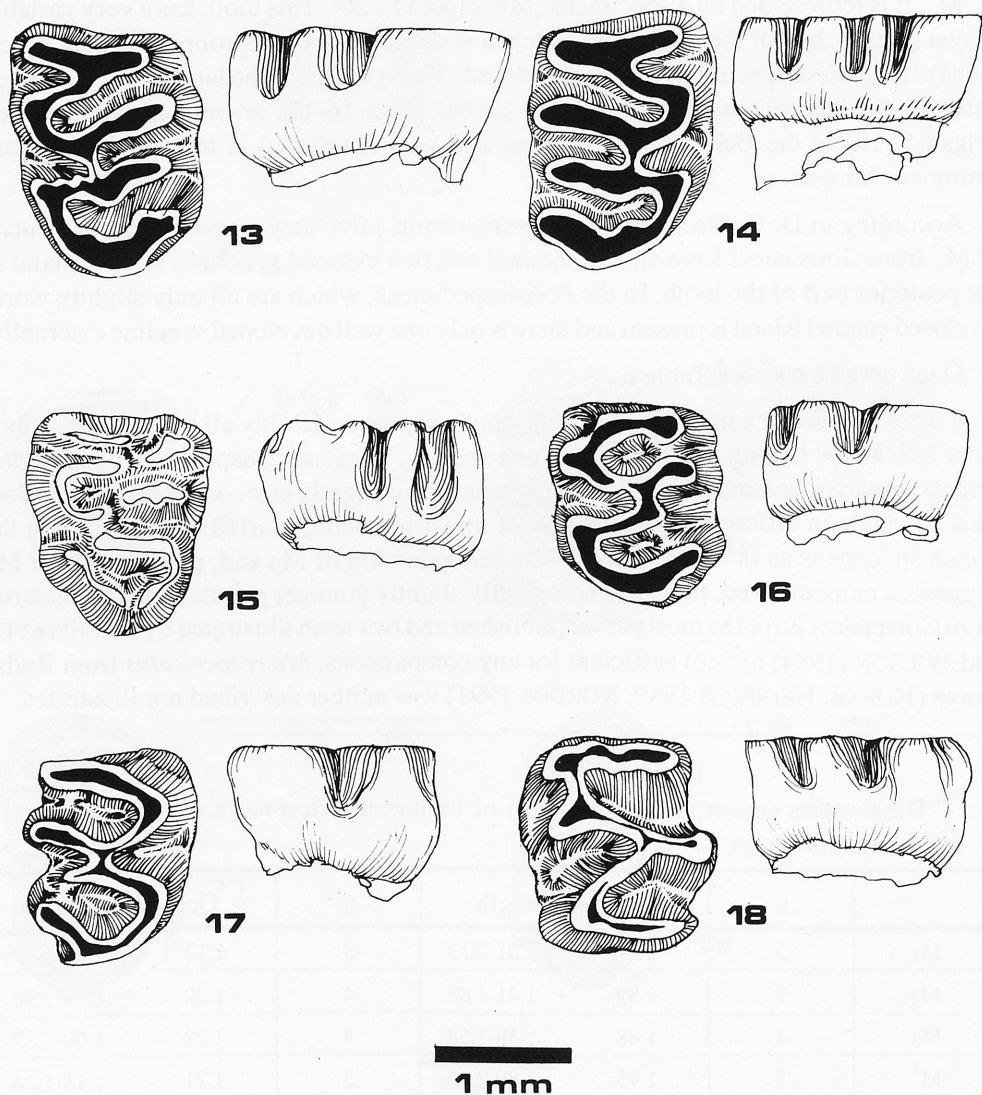


Fig. 13-18. *Microtocricetus molassicus*, Bełchatów – A. 13 –  $LM^2$ , No 2133/15; 14 –  $RM^2$ , No 2133/16; 15 –  $LM^3$ , No 2133/17, 16 –  $RM^3$ , No 2133/18; 17 –  $LM^3$ , No 2133/19; 18 –  $RM^3$ , No 2133/20.

intermediary states of this character. In my opinion, *Sarmatomys podolicus* is conspecific with *Microtocricetus molassicus* and the name of the Ukrainian species is the junior synonym of the last species.

TOPACHEVSKI and SKORIK (1988) described also a new genus and species, *Tsaganocricetus irtyschensis* as another member of the tribe *Microtocricetini* created by them in the same paper. The new taxon is based on two teeth ( $M^1$  and  $M^3$ ) found in Upper Miocene layers of Eastern Kazakhstan. These teeth are much larger than those of *Microtocricetus* and of very different crown-pattern. Their systematic position is difficult to evaluate but they do not seem to be related with *Microtocricetus*.

TLEUBERDINA (1989) listed "*Microtocricetus* sp." from a fauna of Kalkaman near Pavlodar, on the Irtysh river in Eastern Kazakhstan. Neither a description nor an illustration of the material are given.

*Microtocris molassicus* was present in western, central and eastern Europe during the Early Vallesian. Its ancestors are not known. It is possible that it underwent evolution during that period but the existing material is insufficient to reconstruct it.

### III. DISCUSSION

The presence of *Microtocricetus molassicus* is important to the geological dating of the layers in the mine of Bełchatów where its remains have been found. These layers, known as Bełchatów – A, include a succession of narrow brown coal seams, highest in the succession of Bełchatów and divided by limnic sediments.

According to DE BRUIJN et al (1992) the localities Hammerschmiede, Götzendorf and Rudabanya all belong to the Lower Vallesian (MN Unit 9). The localities of Marktl, Priay II and probably also Gritsev in the Ukraine are of the same geological age. The mammalian fauna of all these localities contains many common elements. It is characteristic that none of them contains murids, which appear in Europe on the boundary of the Lower and Upper Vallesian.

The MN 9 unit (Lower Vallesian) is the equivalent of the Lower Pannonian in central Parathetys. Absolute datings are not available for any of the localities with *Microtocricetus*. According to KORDOS (1991), the probable absolute age of Rudabanya is about 11.5 Ma. According to DE BRUIJN et al. (1992), the beginning of MN 9 in Höwenegg is dated at 11.8-0.6 Ma. The end of the brown-coal sedimentation at Bełchatów took place about 11-10 Ma ago.

The rodent fauna accompanying *Microtocricetus molassicus* in Bełchatów – A has not as yet been studied in detail. It is very diversified and the presence of the following genera was noted: *Miopetaurista*, *Spermophilinus*, *Blackia*, *Anomalomys*, *Leptodontomys*, *Keramidomys*, *Eumyarion*, *Megacricetodon*, *Democricetodon*, *Myoxus*, *Bransatoglis*, *Glirulus*, *Microdyromys*, *Muscardinus*. *Muridae* are not present. The fauna suggests the existence of both forested and open environments.



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