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Bjornkurtenia, a new genus of primitive voles of Europe (Rodentia, Mammalia)

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Bjornkurtenia, a new genus of primitive Arvicolidae is described. Its type species is *B. canterranens* (Michaux, 1976), known from the early Pliocene fauna of Terrats in France. New, more complete material of this species from a Polish Lower Pliocene locality Podlesice is described and shows that the species, originally described as *Trilophomys canterranensis*, does not belong to *Trilophomys* but represents a new genus, one of the most primitive in the family Arvicolidae.

1. Introduction

Michaux (1976) described the fauna from a new locality of Early Pliocene small mammals, Terrats in the Canterrane valley, Rousillon district, southern France. It contained *Castor* sp., *Cricetus* sp., *Prosomys* (*Polonomys*) *insuliferus*, *Apodemus* sp., *Anthracomys* cf. *meini*, *Prolagus* sp. and a new species of rodent, which he named *Trilophomys canterranensis*. This last form was rare, represented only by 8 molars (3 M^1, 2 M^2, 1 M_1 and 2 M_2). Neither upper nor lower third molars were collected.

In the description of this new species Michaux (1976) stressed the difference between it and all known taxa of the genus *Trilophomys* Depéret, 1890: *T. pyrenaicus*, *T. schaubi* and *T. depereti*. According to him, *T. canterranensis* is much more primitive than other species of this genus, but belongs to the same evolutionary line.

The Polish fossil locality Podlesice (Kowalski 1956) is of the same age as Terrats: both represent Early Rousillon (MN 14 according to Mein 1975). Its up-dated faunal list was published recently by Kowalski (1988). Originally, only one species of Arvicolidae was described from Podlesice: *Prosomys* (*Polonomys*) *insuliferus* (Kowalski, 1958). After a detailed analysis of the material I came to the conclusion that two different species of voles were present in this fauna. One of them is *P. insuliferus*, the second is identical with *Trilophomys canterranensis* Michaux, 1976. Direct comparison with French specimens from Terrats did not reveal any specific differences. However, besides first and second molars, already known from France, there were also third upper molars at Podlesice. Their pattern is very different from that of *Trilophomys*. In the revision of mammals from Podlesice (Agadjanian

& Kowalski 1978) I therefore listed the species as "*Trilophomys*" *canterranensis*.

The new material makes it possible to state that this species belongs to a new genus of primitive Arvicolidae. It was found recently also in a German locality Gundersheim 4 (Fejfar, pers. comm.), and it is also probably present in Ostramos 9 in Hungary (Jánossy 1974).

The material from Podlesice described in this paper is stored in the collections of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Cracov, Poland.

2. Description

Bjornkurtenia gen. n.

Type species: *Trilophomys canterranensis* Michaux, 1976.

Derivation of the name: In honour of the eminent paleontologist Björn Kurtén.

Diagnosis

Primitive representative of Arvicolidae with mesodont, rooted molars. Molars rather short, their enamel undifferentiated, very thick, without dentine tracks. No cementum in re-entrant angles. Occlusal surface of M_1 composed of posterior loop, three enamel triangles and short, obliquely placed anterior loop without enamel island in worn specimens. M^3 of medium length. Its anterior re-entrant very deep, remains open even in worn teeth. Posterior lingual re-entrant transforms with wear into a large enamel island. All upper molars with three roots.

Compared with *Celadensia* Mein, Moissenet & Adrover, 1983, *Bjornkurtenia* has more symmetric molars, in which the difference in depth of lingual and labial re-entrants is small. In *Bjornkurtenia* M_1 has a shorter anterior loop, its M^3 is less reduced.

In comparison with *Trilophomys* Depéret, 1890, *Bjornkurtenia* has much less hypsodont and more symmetric molars. *Trilophomys* is a much less derived genus, which represents a particular branch, independent of Arvicolidae, in the evolution of Cricetidae.

The collection from Podlesice is composed of isolated molars: 6 M_1, 7 M_2, 12 M^1, 3 M^2 and 5 M^3 (MF/1629).

Description

Molars are rooted, their crowns are relatively low, in unworn specimens considerably narrower on the occlusal surface than at the base of the crown. Enamel very thick, undifferentiated; there are no dentine tracks and no cementum in re-entrants.

M_1 (Fig. 1A–D) with two roots, anterior root laterally, posterior antero-posteriorly compressed. Its occlusal surface composed of posterior loop, three enamel triangles and anterior loop, which is short and obliquely placed. No island is present on the anterior loop. Posterior triangle nearly closed, anterior one broadly connected with the middle one and with anterior loop. The ends of salient angles bend backwards.

M_2 (Fig. 1E–F, Fig. 2A–D) with two roots, both antero-posteriorly compressed, posterior one placed obliquely to the main axis of the tooth. Posterior root without incision. On each side of the tooth two re-entrant angles, lingual deeper than labial. Two intermediate enamel triangles broadly confluent.

M^1 (Fig. 2E–F, Fig. 3A–C) with three roots. The anterior one is the largest, nearly round in section, the posterior one smaller and also round. Below the labial edge of the crown there is the third root, laterally compressed. On the labial as well as on lingual side of the crown there are two re-entrants, external ones are deeper. The anterior loop is narrow. All enamel loops and triangles broadly confluent.

M^2 (Fig. 3D–F) with three roots. Two anterior ones of about the same size, labial slightly larger and round, lingual smaller and slightly laterally compressed. In one specimen between the roots on the ligual side there is a minuscule fourth root. The tooth is strikingly short. On the lingual side there is only one, on the labial side two re-entrants. Posterior lingual re-entrant is very deep, bending backwards in its terminal part. Posterior loop broadly confluent with the posterior triangle.

M^3 (Fig. 4) with three roots, posterior one being the largest. All roots are round in section. In one specimen anterior roots are fused together. Occlusal surface is broad and short. Anterior labial re-entrant very deep, remains open until very late stage of wear. Anterior lingual re-entrant also deep, reaching near the external border of the tooth. With the wear, its terminal part be-

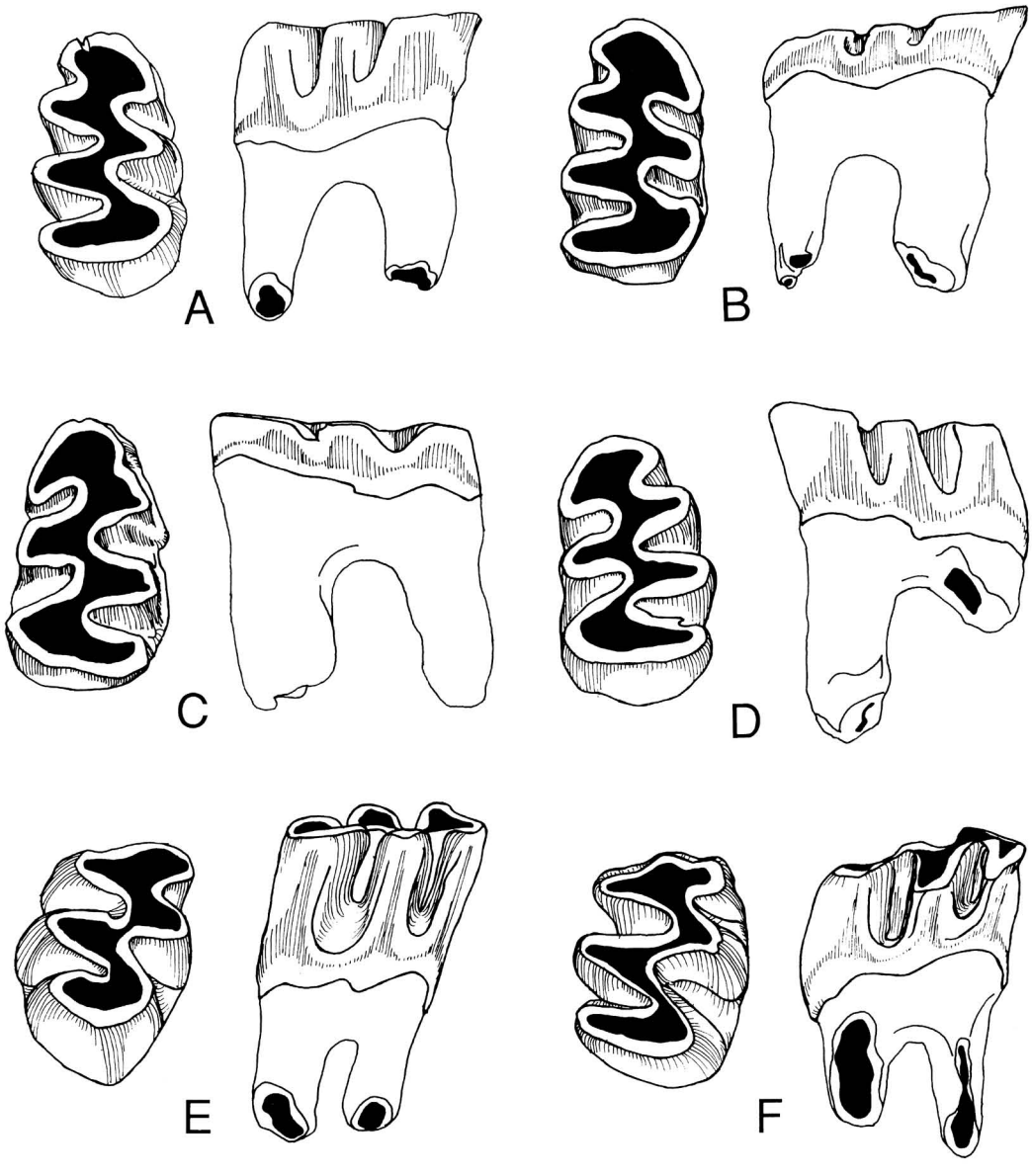

Fig. 1. *Bjornkurtenia canterranensis*, Podlesice. — A: LM_1, No. 1629/1 (1.69×1.04); — B: LM_1, No. 1629/2 (1.96×1.05); — C: RM_1, No. 1629/3 (1.94×1.18); — D: RM_1, No. 1629/5 (1.75×1.12); — E: LM_2, No. 1628/7 (1.36×1.08); — F: LM_2, No. 1629/8 (1.48×1.04).

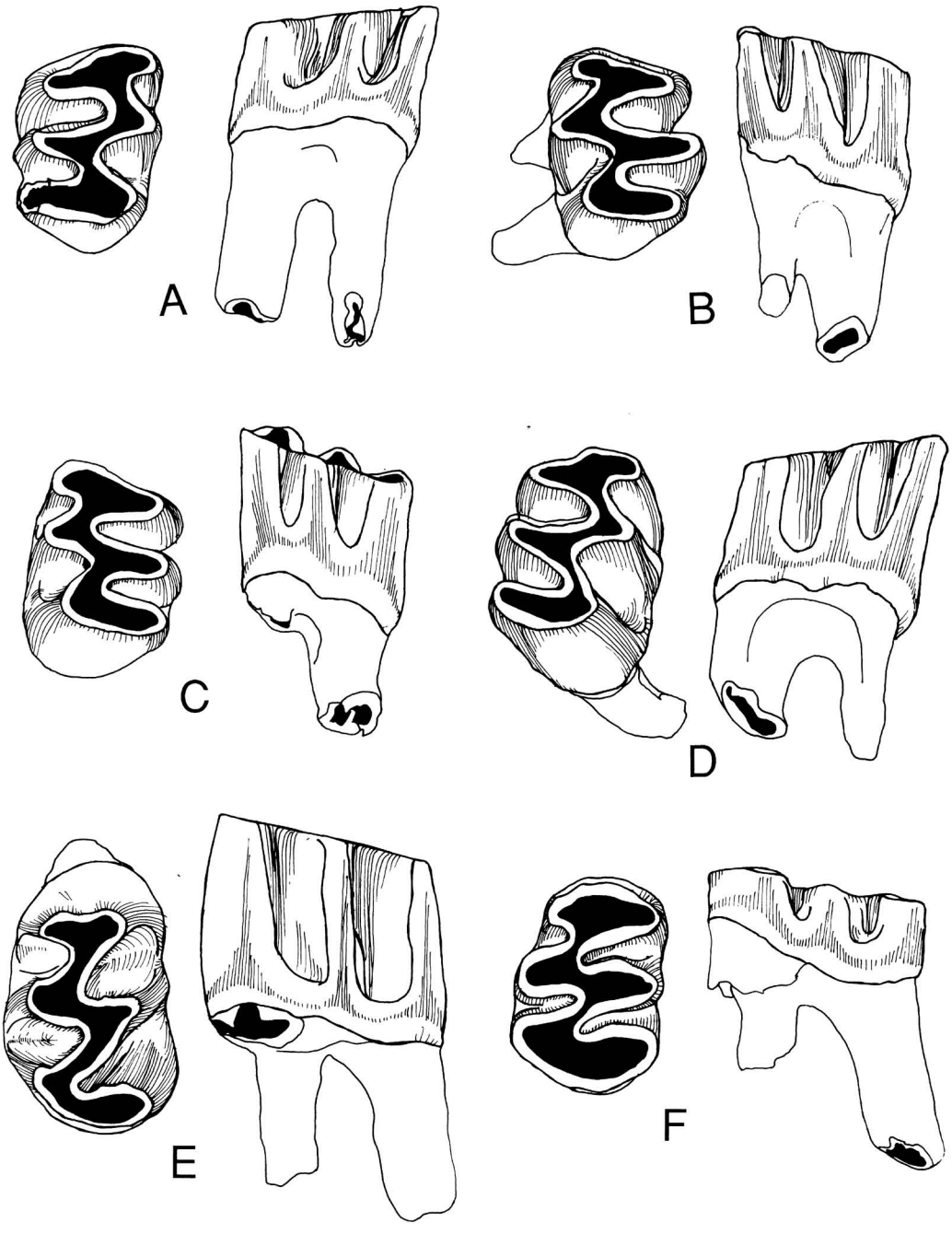

Fig. 2. *Bjornkurtenia canterranensis*, Podlesice — A: LM_2, No. 1629/9 (1.40×1.03); — B: RM_2, No. 1629/10 (1.43×1.02); — C: RM_2, No. 1629/11 (1.40×0.92); — D: LM_2, No. 1629/12 (1.58×0.95); — E: RM^1, No. 1629/14 (1.77×0.99); — F: RM^1, No. 1629/16 (1.74×1.20).

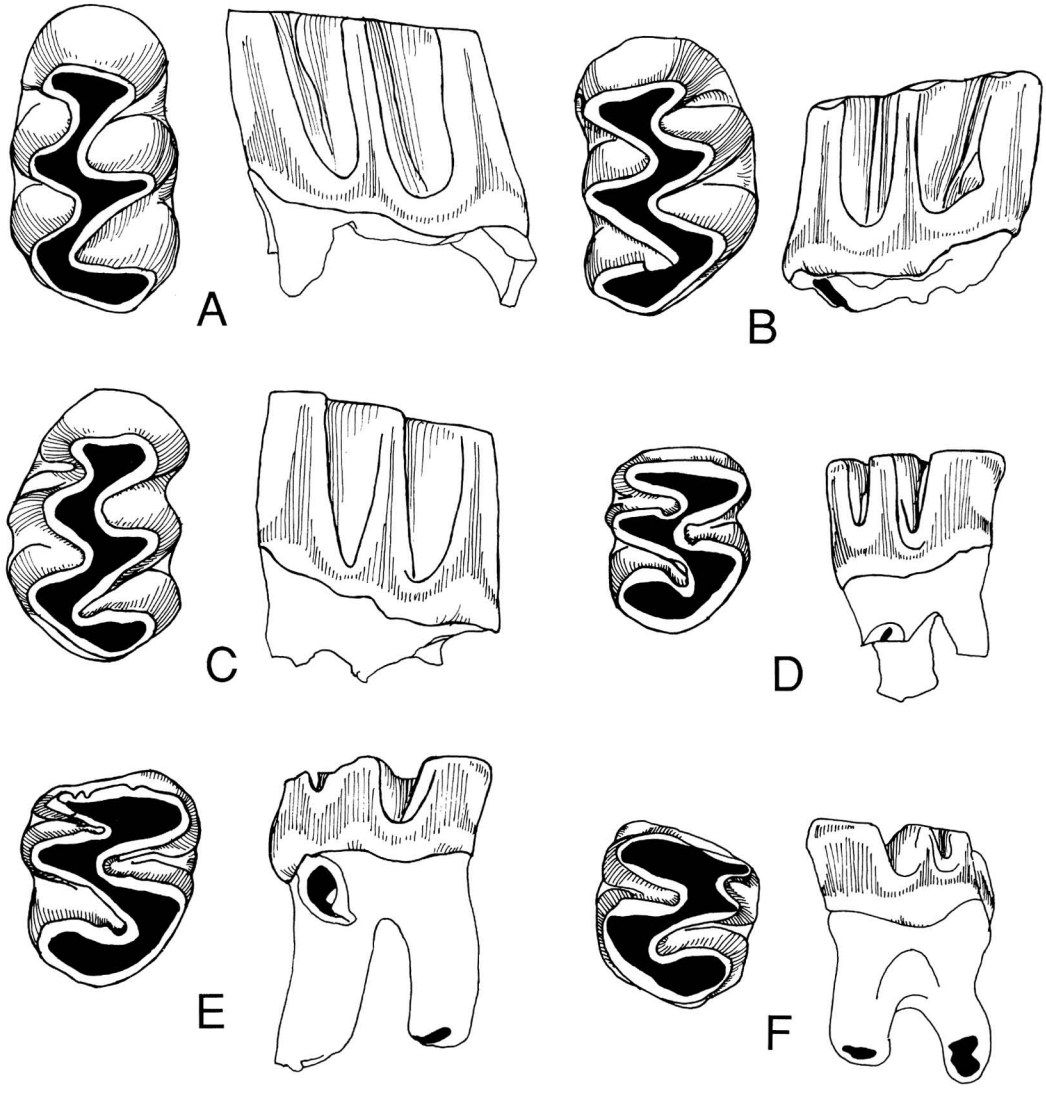

Fig. 3. *Bjornkurtenia canterranensis*, Podlesice. — A: RM^1, No. 1629/18 (1.73×0.93); — B: LM^1, No. 1629/22 (1.74×1.06); — C: RM^1, No. 1629/25 (1.72×1.02); — D: LM^2, No. 1629/26 (1.26×0.95); — E: LM^2, No. 1629/27 (1.45×1.17); — F: RM^2, No. 1629/32 (1.28×1.10).

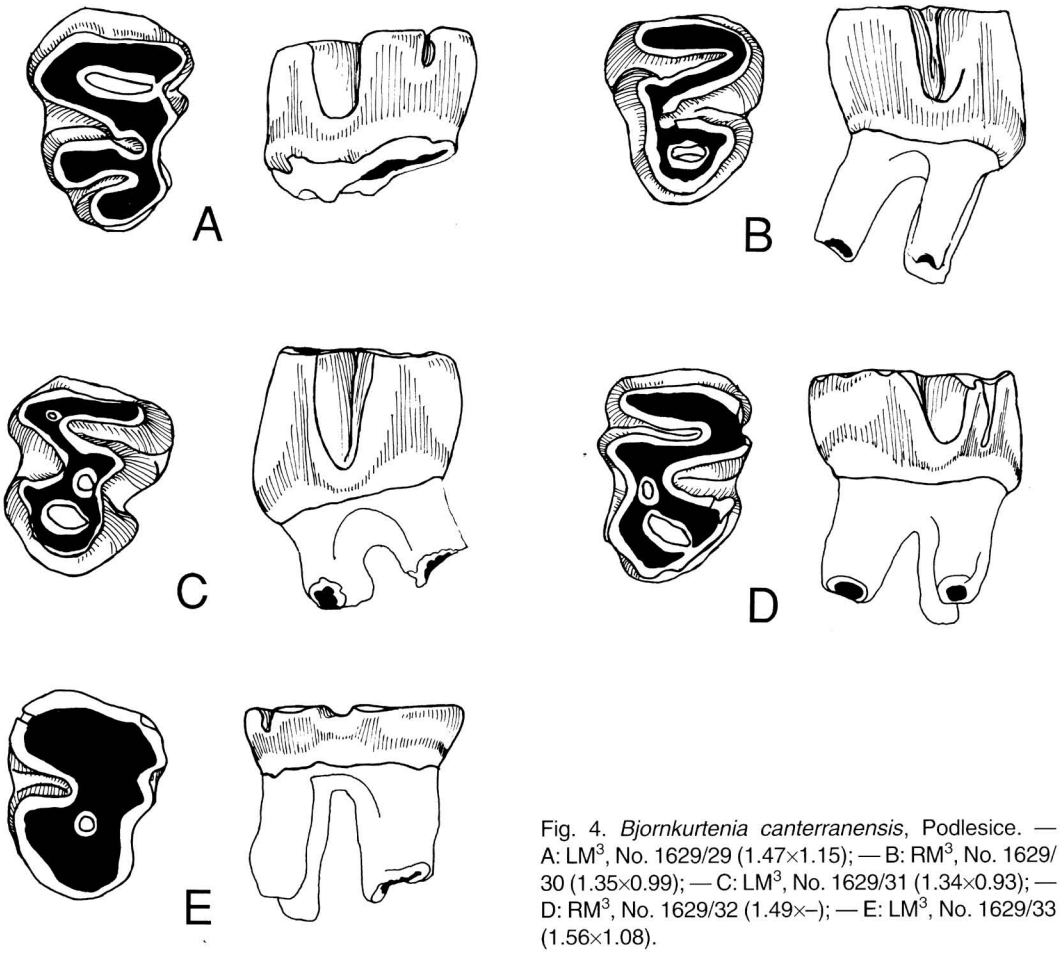

Fig. 4. *Bjornkurtenia canterranensis*, Podlesice. — A: LM^3, No. 1629/29 (1.47×1.15); — B: RM^3, No. 1629/30 (1.35×0.99); — C: LM^3, No. 1629/31 (1.34×0.93); — D: RM^3, No. 1629/32 (1.49×–); — E: LM^3, No. 1629/33 (1.56×1.08).

comes closed and forms an island. Posterior lingual re-entrant also transforms early into a large, tranversally situated enamel island which persists until the very late stage of wear. Posterior buccal re-entrant very shallow.

Dimensions: See Table 1.

3. Discussion

Bjornkurtenia canterranensis is represented in Podlesice exclusively by isolated teeth. They differ from those of *Prosomys* (*Polonomys*) *insuliferus*, the only other representative of Arvicolidae, which is much more numerous in this locality, in their smaller dimensions, lower crowns, broader enamel layer and relatively broader crowns.

Bjornkurtenia canterranensis differs also from other species of European *Prosomys* (usually known under the generic name *Promimomys*

Table 1. Dimensions (mean and range, mm) of molars in *Bjornkurtenia canterranensis* from Podlesice.

	n	Occlusal length		Occusal width	
M_1	6	1.84	1.69–1.96	1.10	1.04–1.18
M_2	7	1.43	1.36–1.58	1.01	0.92–1.08
M^1	12	1.75	1.65–1.81	1.06	0.93–1.28
M^2	3	1.33	1.26–1.45	1.07	0.95–1.17
M^3	5	1.44	1.34–1.56	1.03	0.93–1.15

Kretzoi, 1955; see discussion in Agadjanian & Kowalski 1978) in the shortened molars, simpler structure of M^1 and different pattern of M^3.

Bjornkurtenia may be a sister group to *Celadensia*, known from a layer of similar age in Spain. The differences between these two genera were enumerated in the diagnosis of *Bjornkurtenia*. Mein et al. (1983) have already remarked on the similarity of *Celadensia nicolae* and "*Trilophymus*" *canterranensis* (at that time M^3 of the last species was unknown), they came, however, to the conclusion that "une filiation directe parait difficilement envisageable".

Germanomys Heller, 1936 approaches *Bjornkurtenia* in its very thick enamel and small dimensions, the anterior loop of its M^1 is, however, much higher, this tooth being more elongated. The molars in *Germanomys* are also more hypsodont.

Jánossy (1974) described from the Hungarian Pliocene locality Ostramos 9 a new species, *Promimomys microdon*. It is represented only by the holotype, a damaged M_1. Its dimensions and crown-pattern do not differ from those of corresponding tooth in *Bjornkurtenia*, but its lingual re-entrants are (according to the drawing) slightly different in shape. The specimen may belong to *Bjornkurtenia canterranensis*, but the material is so scarce that a definitive identification is impossible.

In two localities (Terrats and Podlesice) *Bjornkurtenia canterranenesis* is accompanied by *Prosomys* (*Polonomys*) *insuliferus*. This last species is also present in company with *Celadensia* in Spain (Mein et al. 1983).

At the very end of the Miocene and especially in the Early Pliocene in Europe there occurred an important radiation of cricetids, which resulted in the development of numerous evolutionary lineages of rodents with hypsodont, simplified, lophodont molars. Most of these lineages were short-lived and disappeared after the development of typical voles (Arvicolinae). Among those of longer duration were Baranomyinae, characterised by small dimensions and crown-pattern of molars very similar to Arvicolinae. Their mandible was, however, cricetine in type (Repenning 1968). According to Mein et al. (1983) *Celadensia* belongs to Baranomyiinae. The teeth of *Bjornkurtenia* approach very much those of the primitive Arvicolinae. Without knowledge of the structure of the mandible the systematic position of these two genera cannot be definitely fixed. *Prosomys* (*Polonomys*) *insuliferus*, present at the same time, was already a typical representative of Arvicolinae.

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