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Some insectivore (Mammalia) remains from the Late Miocene locality of Alsótelekes (Hungary)

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(with 1 figure, 2 tables and 3 plates)

Abstract

Six Insectivora species (*Plesiosorex* sp., *Florinia* cf. *stehlini*, *Allosorex* cf. *stenodus*, *Crusafontina endemica*, *Miosorex* sp., Soricinae gen. et sp.) were found in the Alsótelekes Late Miocene fossil material. The incectivores allow for an allocation into the Early Vallesian MN 9 Zone. The fauna is indicative of humid, forested vegetation. The taphonomic features of the teeth suggest long transport by water before the lacustrine accumulation of the remains.

Introduction

Alsótelekes village (North Hungary, Borsod-Abaúj-Zemplén county) is situated at the soutwestern margin of the Rudabánya mountains, about 5 kilometres northeast of the Late Miocene hominoid locality, Rudabánya. The Triassic gipsum layers of the mine of Alsótelekes are covered by Late Miocene lacustrine and fluvial sediments. A Hipparion fauna, contained also *Anapithecus* remains, was collected in 1993 from the lower part of this sequence by KORDOS (1997).

Only 15 insectivore remains were found in the sample by the present author. The material contains mainly isolated and fragmented teeth (see Tab. 1.) However, this little and poorly preserved material has great particularity, because so far this is the oldest known insectivore fauna from Hungary.

The material is stored in the Geological Museum of Hungary (GMH) of the Geological Institute of Hungary (cat. nr.: V. 20648 - V. 20651.) The SEM photos were made in the Scanning Electronmicroscope Laboratory of the Geological Institute, Eötvös University. The measurements are taken after REUMER (1984, Fig. 4) in millimetres. The morphological nomenclature and the abbreviations are used after REUMER (1984, pp. 5-6, Figs 1-3).

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Insectivora species	number of specimens	minimum nr. of individuals	isolated teeth
Plesiosorex sp.	2	1	2
Florinia cf. *stehlini*	1	1	1
Allosorex cf. *stenodus*	3	1	3
Crusafontina endemica	7	2	7
Miosorex sp.	1	1	0
Soricinae gen. et sp.	1	1	0
Total number	15	9	13(86.66%)

Table 1. The catalogue of the Alsótelekes insectivores

Systematic part

Classis Mammalia LINNAEUS 1735
Order Insectivora BOWDICH 1821
Family Metacodontidae BUTLER 1948
Genus *Plesiosorex* POMEL 1854

Type species: *Erinaceus soricinoides* BLAINVILLE 1838, Chaufour, France, Oligocene, Stampian.

Occurrence: Middle Oligocene - Late Miocene (MN 9), Europe, Asia and North America.

Plesiosorex sp.
Pl. 1, Figs 1-2

Studied material and measurements: 1 right M_1 fragment (TRD L = 1.60, TRD W = 1.20) and 1 left M_2 fragment (TRD L = 1.20, TRD W = 1.16).

Description

M_1 - The trigonid of this big tooth is deeply basined, it is lingually curved. The highest cusp is the protoconid, well separated from the metaconid. The paralophid is divided by a fissure. The ectocingulid is bent upwards below the protoconid.

M_2 - The trigonid is very short. The paraconid is low, the higher proto- and metaconid are same in size. A large ectocingulid is present in the anterior side of the tooth.

Family Soricidae GRAY 1821
Subfamily Crocidosoricinae REUMER 1987
Genus *Florinia* ZIEGLER 1989

Type species: *Sorex stehlini* DOBEN-FLORIN 1964, Wintershof-West, Germany, Early Miocene, Orleanian, MN 3.

Occurrence: Early Miocene (MN 3) - Late Miocene (MN 9), Europe.

Florinia cf. *stehlini* (DOBEN-FLORIN, 1964)

1964 - *Sorex stehlini* - DOBEN-FLORIN, p. 41, pl. 5, figs 1, 2, 6-8 (Wintershof-West).
1989 - *Florinia stehlini* (DOBEN-FLORIN, 1964) - ZIEGLER, p. 45, pl. 6, figs 1-3 (Petersbuch 2, Erkersthofen).
1994 - cf. *Florinia stehlini* (DOBEN-FLORIN, 1964) - Rzebik-Kowalska, p. 138, fig. 1a (Belchatów).

Holotype: lower jaw fragment with M_1-M_3, DOBEN-FLORIN (1964), p. 41, tab. 5, figs 1 a-h. Type locality: Wintershof-West (Germany, Orleanian, MN 3).

Studied material: 1 left I_1 fragment. Because of the bad preservation of the tooth, the detailed measurements could not be taken.

Description

I_1 - The apex is sharp, up-turned. The lower incisor is bicuspulate, the first cuspule is low, the second one is higher and longer. The incisor is very fragmented, but its size and the significantly shaped cuspules refer it to *Florinia* cf. *stehlini*.

Miosorex KRETZOI 1959

Type species: *Sorex pusillus* var. *grivensis* DEPÉRET 1892, Grive-Saint-Alban (Isére) (France Vindobonian, MN 4).

Occurrence: Early Miocene (MN 2) - Late Miocene (MN 9), Europe.

Miosorex sp.
Tab. 1, Figs 3 a-c

Studied material and measurements: 1 right mandible fragment with M_3 and the fragment of M_1-M_2, (M_1 L = 2.03, M_3 L = 0.97, W = 0.58), GMH - V. 20648.

Description

Mandible - The foramen mentale is situated under the M_1 protocone.

M_1 - M_2 - These molars are very fragmented. The post- and the ectocingulids are

well developed. The postentoconid valley is shallow on M_1.

M_3 - The oblique crest ends between the proto- and metaconid. The talonid is basined, the hypoconid and the entoconid are present, but the postentoconid valley is absent. A well developed cingulid runs round the tooth.

Subfamily Allosoricinae FEJFAR 1966
Genus *Allosorex* FEJFAR 1966

Type species: *Allosorex stenodus* FEJFAR 1966, Ivanovce, Slovakia, Late Pliocene, Ruscinian, MN 15.

Occurrence: Late Miocene (MN 9) - Pliocene (MN 15), Europe.

Allosorex cf. *stenodus* FEJFAR 1966
Pl. 3, Figs 11-13

1966 - *Allosorex stenodus* nov. gen., nov. sp. - FEJFAR, p. 227, figs 1-9, Ivanovce.

Holotype: right mandible fragment with the lower incisor, SÚÚG, OF, No. 651 273., type lcality: Ivanovce, Slovakia, Late Pliocene, Ruscinian, MN 15.

Occurrence: Late Miocene (MN 9) - Pliocene (MN 15), Europe.

Studied material and measurements: 1 right M^1 (AW = 1.96, LL = 1.70), 1 right M_1 (L = 2.03, W = 0.98), 1 right M_2 (L = 1.68, W = 0.90).

Description

M^1 - The protocone and the metacone are strong, the paracone and the hypocone are also well developed, but somewhat lower than the previous ones. The metastyle is broken, the parastyle and the metastyle are about the same in their length. The trigon basin is deep, the the talon is emarginated. The mesostyle is not divided.

M_1 - The talonid is broken, so the entoconid crest and the postentoconid valley could not be studied. The trigonid is much longer than the talonid. Weak cingula are present on the buccal and the posterior sides.

M_2 - The trigone is very long, the talonid basin is deep, the postentoconid valley and the entoconid crest are well developed. Cingulum is preserved only on the antero-buccal part.

Remarks: The big-sized, specially adapted lower molars (the trapezoid posterior part of the long trigonid, the strong cutting edge between the proto- and the paraconid, the U-shaped valley in the lingual side of the trigonid, the deep postentoconid valley) refer the Alsótelekes *Allosorex* to the type species, described by Fejfar (1966) from the Late Pliocene of Slovakia. The Alsótelekes specimens are somewhat shorter than the Ivanovce ones (Fejfar 1966, p. 236, tab. 4.).

Subfamily Soricinae FISCHER VON WALDHEIM 1817
Tribe Anourosoricini ANDERSON 1879
Genus *Crusafontina* GIBERT 1974

Type species: *Crusafontina endemica* GIBERT 1974. Can Llobateres, Spain, Late Miocene, Vallesian, MN 9.

Occurrence: Late Miocene (Vallesian, MN 9 - Turolian, MN 13), Europe.

Crusafontina endemica GIBERT 1974
Pl. 2, figs 5-8, Pl. 3, Figs 9-10

1975 - *Crusafontina endemica* GIBERT 1974 - GIBERT, p. 118., figs 6., 7a-b. (Can Llobateres).
1976 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - KRETZOI et al., p. 375. (Rudabánya).
1984 - *Amblycoptus vicinus* KRETZOI 1954 - KRETZOI, p. 215. (Sümeg).
1984 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - KRETZOI, p. 215 (Sümeg).
1985 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - RABEDER, p. 447. (Rudabánya).
1991 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - KORDOS, p. 348. (Rudabánya).
1996 - *Crusafontina endemica* GIBERT 1974 - MÉSZÁROS, p. 10., pl. 1, figs 3a-e., pl. 2., figs 4 a-d (Sümeg).
1998 - *Crusafontina endemica* GIBERT 1974 - MÉSZÁROS, p. 147, pl. 1., fig. 1., pl. 2. figs. 6-15., (Sümeg).
1998 - *Crusafontina* aff. *endemica* GIBERT 1974 - ZIEGLER & MÉSZÁROS, in press (Rudabánya).

Holotype: left mandible fragment with P_4-M_2, Nr. 9002, GIBERT (1975), p.118. Type locality: Can Llobateres (Spain, Vallesian, MN 9).

Occurrence: Late Miocene (Vallesian, MN 9 - 10), Europe.

Studied material and measurements: 1 right I^1 (L = 2.35, H = 1,58), 1 right I^1 fragment (H = 1.75), 1 right I_1 (L = 4.50, H = 1.18), 1 right I_1 fragment (H = 1.20), 1 right P^4 fragment (H = 2.23), 1 left P^4 fragment (BL = 2.25), 1 left M_1 fragment, GMH - V. 20651.

Description

I^1 - The apex is sharp and longer than that of the close relative *C. kormosi*. The basal margin is slightly concave. Well developed conule and cingulum are present on the buccal side.

P^4 - Only the buccal part of the fragmented praemolars are present. The parastyle is protruding and turns buccally. The posterior margin seems slightly emarginated.

I_1 - The lower incisor is clearly bicuspulate, the apex is sharp and up-turned.

Remarks: The general size, the basal margin of the upper incisor, the bicuspulate lower one and the protruding P^4 parastyle make us sure that this Anourosoricini teeth belong to *Crusafontina*. Many *Crusafontina* remains came from different European localities

of Late Miocene Vallesian and Turolian ages, which were ranged to two species by MÉSZÁROS (1998). Unfortunately, the main differential characters between *C. endemica* (MN 9-10) and *C. kormosi* (MN 10-13) could not be studied on the present material. However, the measurements of the upper incisor refer the Alsótelekes *Crusafontina* to the older species (Fig. 1).

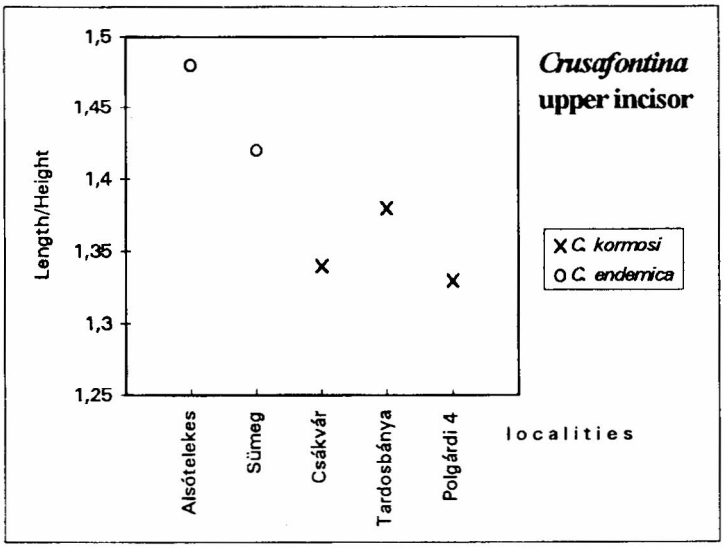

Fig. 1. Comparison of the I^1 length/height ratio of the *Crusafontina* remains from different localities. Its measurements refer the Alsótelekes incisor to *C. endemica*. (The data of the other localities are after Mészáros 1998.)

Soricinae gen. et sp.
Pl. 2, Fig. 4

1974 - *Miosorex* cf. *grivensis* (GAILLARD) - KRETZOI et al., p. 375., tab. 2 (Rudabánya).
1991 - *Miosorex* cf. *grivensis* (GAILLARD) - KORDOS, p. 348, tab. 1 (Rudabánya).
1985 - *Miosorex* cf. *grivensis* (GAILLARD) - RABEDER, p. 447 (Rudabánya).
1998 - Soricidae gen. et. sp. indet. - ZIEGLER & MÉSZÁROS, in press (Rudabánya).

Studied material and measurements: 1 left mandible fragment with M_2 (L = 1.20, W = 0.70) and M_3 (L = 0.89, W = 0.50), GMH - V. 20649.

Description

M_2 - The trigonid and the talonid basins are deep. The a hypo- and entoconid are clearly lower than the para-, proto- and metaconid. The hypolophid ends behind the entoconid, the postentoconid valley is wide and deep. The oblique crest runs to the

lingual side of the protoconid. A low entoconid crest is present. Weak cingulid runs round the tooth.

M_3 - The talonid is much lower than the trigonid. The talonid specially weaks up forwards, the oblique crest runs to the metaconid. The talonid is basined, the hypoconid and the entoconid are present, entostylid is not separated. The cingulum is present on the buccal and the posterior sides, but absent on the lingual one.

Remarks: Not many taxonomically important detailes can be studied on this fragmented jaw. Even so, in consequence of the size and the morphology of the M_1, this form seems to be the same as the species described by ZIEGLER & MÉSZÁROS (1998) from Rudabánya quarry. By the lingual emargination of the condylus that specimen could be referred to the subfamily Soricinae.

Discussion

The relative frequency of the isolated teeth is very high (see Tab. 1). All remains are poorly preserved, but they are not digested. Many cones and most of the roots are missing. The intensive breakage pattern could have been caused by long fluviatile transport before the lacustrine accumulation of the mandible fragments and the teeth.

The resemblance between the Alsótelekes and other earliest Vallesian Soricid faunas (Rudabánya, Can Llobateres, Belchatów) make us sure that the locality is correlative with the Late Miocene MN 9 Zone (Tab. 2). This assemblage is perhaps older than the Rudabánya prehominoid localities, since *Blarinella dubia* and *Paenelimnoecus repenningi*, the typical Late Miocene shrews, here do not occur yet. However, we can not be sure about the relation of the two sites, because the Alsótelekes material is so limited, as the absence of these species can be occassional.

The MN 9 Zone is indicated by the coexistence of the early Crocidosoricinae and Heterosoricinae and the modern Soricinae. This reflects to the great change in the Soricidae fauna of Europe, caused by a climatic turnover during the Late Miocene (RZEBIK-KOWALSKA 1995). The somewhat colder and more arid climate caused the disappearance of many small-sized Crocidosoricinae and the subordination of Heterosoricinae shrews with the immigration of Soricinae and Allosoricinae ones. The subfamiliar constitution of the Alsótelekes assemblage suggests a transition between the Middle and the Late Miocene climates. The crocidosoricines prefered steady weather conditions. This is suppported by the absence of Crocidurinae, wich are adaptated to quite dry climate. On the other hand, the rife occurrence of Soricinae indicates not so warm and humid circumstances as in the Middle Miocene.

By its incidence in forested or at least partly wooded areas, we can suppose the habitat of *Crusafontina* as well-watered environment. This view is supported by its close relation to the extant *Anourosorex squamipes*, which occures in the mountain forests of SE Asia. On the basis of the *Crusfontina* occurrence, there maight have been closed vegetation in the surroundings of the lake, in which the fossiliferous layers of Alsótelekes were deposited.

INSECTIVORES	LOCALITIES				
	Alsótelekes	Rudabánya	Rudabánya	Can Llobateres	Belchatów
	this paper	KRETZOI et al. 1976	ZIEGLER & MÉSZÁROS in press	GIBERT 1974	RZEBIK-KOWALSKA 1993&1994
Plesiosorex	+	-	+	-	+
Limnoecus	-	-	-	+	-
Florinia	+	-	-	-	+
Miosorex	+	+	-	-	+
Oligosorex	-	-	-	+	-
Heterosorex	-	-	-	-	+
Dinosorex	-	+	+	-	+
Allosorex	+	-	-	-	-
Crusafontina	+	+	+	+	+
Blarinella	-	+	-	-	-
Paenelimnoecus	-	+	+	-	-
Soricinae gen. et sp.	+	-	+	-	-

Table 2. Insectivore faunas of the MN 9 Zone correlative localities in Europe. The Rudabánya genera, first reported by KRETZOI et al 1976, are refered here according to the taxonomical revision by RABEDER 1985, KORDOS 1991, ZIEGLER & MÉSZÁROS 1998 and this paper

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Plate 1

Figure 1. *Plesiosorex* sp., right molar fragment, occlusal wiew, 37x.
Figure 2. *Plesiosorex* sp., left molar fragment, buccal wiew, 45x.
Figure 3. *Miosorex* sp., right mandible fragment with molars, GMH - V. 20648., a. buccal view, 21x, b. buccal view of the M_1, 53x, c. occlusal view of the M_3, 98x.

Plate 2

Figure 4. *Soricinae* gen. et sp., left mandible fragment with M_2-M_3, GMH - V. 20649., occlusal wiew, 47x.
Figure 5. *Crusafontina endemica* GIBERT 1974, right I^1, GMH - V. 20651., buccal wiew, 26x.
Figure 6. *Crusafontina endemica* GIBERT 1974, right I^1 fragment, GMH - V. 20651., buccal wiew, 32x.
Figure 7. *Crusafontina endemica* GIBERT 1974, left P^4 fragment, GMH - V. 20651., occlusal wiew, 39x.
Figure 8. *Crusafontina endemica* GIBERT 1974, right P^4 fragment, GMH - V. 20651., occlusal wiew, 36x.

Plate 3

Figure 9. *Crusafontina endemica* GIBERT 1974, right I_1 fragment, GMH - V. 20651., buccal wiew, 30x.
Figure 10. *Crusafontina endemica* GIBERT 1974, right I_1, GMH - V. 20651., buccal wiew, 21x.
Figure 11. *Allosorex* cf. *stenodus* FEJFAR 1966, right M^1 fragment, GMH - V. 20650., ventral wiew, 36x.
Figure 12. *Allosorex* cf. *stenodus* FEJFAR 1966, right M_1 fragment, GMH - V. 20650., buccal wiew, 38x.
Figure 13. *Allosorex* cf. *stenodus* FEJFAR 1966, right M_2 fragment, GMH - V. 20650., occlusal wiew, 51x.

Plate 1

1

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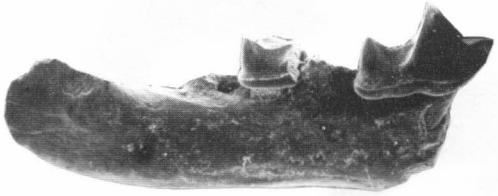

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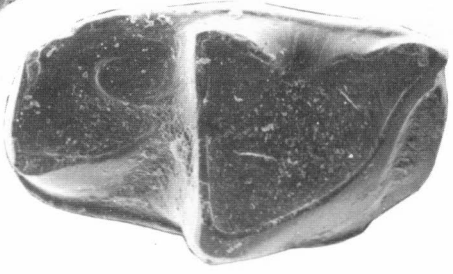

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Plate 2

Plate 3

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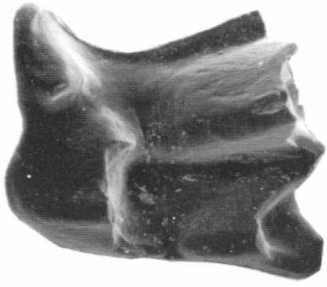

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