ANNALES
UNIVERSITATIS SCIENTIARUM BUDAPESTINENSIS DE ROLANDO EÖTVÖS NOMINATAE

SECTIO GEOLOGICA

TOMUS XXXI.

REDIGIT

T. BÁLDI
B. GÉCZY
E. VÉGH – NEUBRANDT
M. MONOSTORI

BUDAPEST
1996

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UNIVERSITATIS SCIENTIARUM BUDAPESTINENSIS DE ROLANDO EÖTVÖS NOMINATAE

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Annales Univ. Sci. Budapest., Sect. Geol. 31, 1–144 (1996) Budapest

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Annales Univ. Sci. Budapest., Sect. Geol. 31, 5—25 & 119–122 (1996) Budapest

Soricidae (Mammalia, Insectivora) remains from three Late Miocene localities in western Hungary

L. Gy. MÉSZÁROS[1]

(with 4 figures, 8 tables, and 4 plates)

Abstract

The Soricidae fauna of Sümeg, Csákvár and Széchenyi Hill (Hungary) is presented. The following taxa were identified in the fauna: *Dinosorex* sp., *Amblycoptus oligodon* KORMOS 1926, *Crusafontina endemica* GIBERT 1974, *Crusafontina vicina* (KRETZOI, 1954), *Blarinella dubia* (BACHMAYER & WILSON, 1970), *Paenelimnoecus repenningi* (BACHMAYER & WILSON, 1970), Soricidae gen. et sp. indet. The soricids supply new additions for the determining the detailed stratigraphic position of the localites. Based on the shrew material all the three assemblages are correlative with the Late Miocene (Sümeg: Vallesian, Csákvár and Széchenyi Hill: Turolian). The present soricids, occurred in these localities, are suggestive of well watered, wooded environments.

Introduction

Only a few shrew remains were found in the fossil microvertebrate material of the three Late Miocene karstic caves, discussed in the present paper. Nevertheless this material is very particular in the Hungarian Soricidae researches, because we have very few fossil shrew assemblages from the Miocene of Hungary. The shrew remains supplied new additions also for the precise chronological classification and the palaeoecology of the named localities.

KRETZOI (1951, 1954, 1980 and 1984) has worked out the Hipparion fauna of these fossiliferous cave sediments, and has listed the taxa, including the soricid ones, but usually without descriptions and measurements. In some details the faunal lists of the present paper differ from the determinations of KRETZOI.

[1]Department of Palaeontology, Eötvös University, H-1083 Budapest, Ludovika tér 2, Hungary

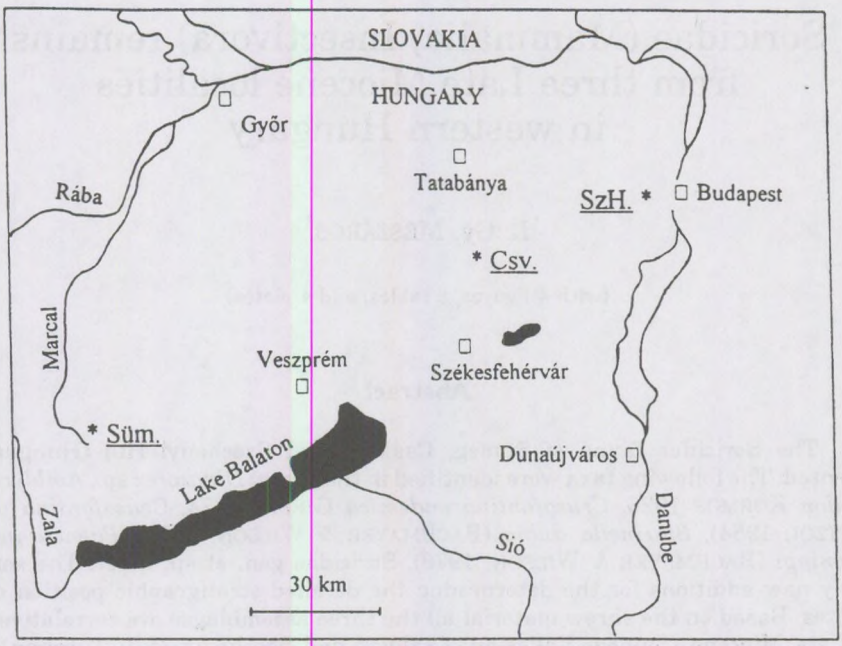

Fig. 1. Geographical situation of the studied localities.

Age	Stage	MN Zone	Locality	Soricidae species						
				Din. sp.	*Amb. ol.*	*Cr. end.*	*Cr. vic.*	*Bl. dub.*	*Pae. rep.*	Sor ind.
Late	Turolian	12	Széchenyi H.		+					
	Turolian	11	Csákvár				+	+	+	
Miocene	Vallesian	10	Sümeg	+		+		+	+	+

Table 1. Stratigraphic position of the studied localities with the occurrences of the Soricidae taxa.

Localities

The localities (Sümeg-gerinc; Csákvár; Esterházy Cave, lowest fossiliferous layer and Széchenyi Hill, Budapest, Svájci street 14) are situated in the Hungarian Transdanubian Central Range. For the geographic situation of the sites see in Text fig. 1, the stratigraphic position and the occurrences of the shrew species are given in Table 1.

Sümeg-gerinc: This locality was a karst-fissure, near Sümeg, of which infilling sediments gave both micro- and macrofaunas. According to KRETZOI (1984), sleeping trees of owls should have been by the fissure. Accumulation of the owl pellets created a thick micro-bone layer in the sediment. From the Sümeg-gerinc site a total of 61 taxa could be identified by KRETZOI. Of these 3 are amphibians, 6 are reptiles, 5 are birds, and 47 are mammal species,

including 5 soricids. In the micromammals the insectivores are comparatively diversified, but the bats and the rodents are few in number.

Csákvár: The Esterházy Cave near Csákvár is in the Triassic dolomite of the Vértes Mountains. The excavations between 1926 and 1951 have found three main fossiliferous levels in the cave sediments. The lowest one, which was a dark grey phosphatic sandy calcareous marl, contained rich Hipparion fauna, including a few Soricidae remains (KRETZOI 1951). The shrew material only of this layer is studied here. The very rich Late Miocene fauna constituted the basis of establishing the continental biostratigraphic unit named "Csákvárium" by KRETZOI. He listed 87 taxa from this site: 3 invertebrates, 2 fishes, 3 amphibians, 6 reptiles, 6 birds and 66 mammals with 3 shrews.

Széchenyi Hill: This old locality is in Budapest, on the eastern side of the Széchenyi Hill. The remains were found in a fossiliferous yellow shale layer, which was excavated by the building operations of a new house, Svájci street 14 (KRETZOI 1984). The total amount of the fauna includes 18 taxa: 1 amphibian, 2 reptiles and 15 mammals, with 3 soricids.

	total number of the specimens			minimum number of the individuals		
	Süm.	Csv.	SzH.	Süm.	Csv.	SzH.
Din. sp.	2	-	-	1	-	-
Amb. ol.	-	-	2	-	-	1
Cr. end.	268	-	-	29	-	-
Cr. vic.	-	1	-	-	1	-
Bl. dub.	13	2	-	2	2	-
Pae. rep.	9	2	-	3	1	-
Sor. ind.	2	-	-	1	-	-

Table 2. Catalogue of the Soricidae remains from the studied localities

Material and method

The studied specimens were collected by M. KRETZOI and L. KORDOS, and were selected from the samples by the author (except for V. 11417. and V. 14044.). The whole material belong to the collection of the Geological Museum of Hungary (in the Geological Institute of Hungary). The catalogue of the soricid material of the three localities includes 301 specimens (more exactly see in Tab. 2). For the nomenclature of the anatomy see REUMER 1984 and MÉSZÁROS 1996, in press b. The measurements are taken in millimetres, after REUMER 1984. The scanning photos were made in the SEM Laboratory of the Geological Institute, Eötvös Loránd University. The abbreviations used in the tables and figures: I = incisor, A = antemolar, P = praemolar, M = molar, L = length, LL = lingual length, BL = buccal length, W = width, AW = anterior with, PW = posterior width, H = height, min. = the minimum value, mean = the mean value, max. = the maximum value, s.e. = standard error of the

mean, s.d. = standard deviation of the mean, Can Ll. = Can Llobateres, Rud. = Rudabánya, Süm. = Sümeg-gerinc, Koch. = Kochfidisch, Csv. = Csákvár, Dorn-D. = Dorn-Dürkheim, SzH = Széchenyi Hill, *Din.* sp = *Dinosorex* species, *Amb. ol.* = *Amblycoptus oligodon*, *Cr. vic* = *Crusafontina vicina*, *Cr. end.* = *Crusafontina endemica*, *Bl. dub.* = *Blarinella dubia*, *Pae. rep.* = *Paenelimnoecus repenningi*, Sor. ind. = Soricidae genus et species indet. On the photos the scales represent 1 mm.

Systematic part

Classis Mammalia LINNAEUS 1735
Order Insectivora BOWDICH 1821
Family Soricidae GRAY 1821

Subfamily Heterosoricinae VIRET & ZAPFE 1952

REUMER (1987) classified this group as family Heterosoricidae. This classification was accepted by some authors. Others did not support the view of REUMER view. They think the family rank of the heterosoricines is not necessary until it is shown that the Heterosoricinae constitute a closely knit unit of fossil shrews which represents a plesiomorphic sistergroup of all other soricid subfamilies.

Genus *Dinosorex* ENGESSER 1972

Type species: *Dinosorex sansaniensis* (LARTET, 1851)

Dinosorex sp.
Pl. 1, Fig 1

? 1984 - *Trymilus* cf. *sansaniense* LARTET 1851 - Kretzoi, p. 215 (Sümeg)

Studied material:
Sümeg: 1 left M_3, 1 right M_3 (V. 20581.)

Measurements: See Tab. 3.

		min.	mean	max.	n.
M_3	L	1.61	1.62	1.63	2
	W	0.98	1.06	1.02	2

Table 3. Measurements of *Dinosorex* sp. from Sümeg-gerinc

Description:

M_3 - The tooth is twoo-rooted. The posytcristid joins the entoconid, there is no divided entostylid. The entoconid crest is absent. Ecto- and posterocingulids are well developed.

Remarks: The available material is too small to determine this form more precisely. This form is perhaps the same what KRETZOI reported from this site as "*Trymilus* cf. *sansaniense* LARTET 1851". But, that taxon, classified nowadays as *Dinosorex*, is somewhat bigger than the present one and has entoconid crest on the lower molars.

Subfamily Soricinae FISCHER VON WALDHEIM 1817
Tribe Anourosoricini ANDERSON 1879

This group is named also as Amblycoptini KORMOS 1926 by some authors, but with the same content as Anourosoricini ANDERSON 1879.

Genus *Amblycoptus* KORMOS 1926

Type species: *Amblycoptus oligodon* KORMOS 1926

Amblycoptus oligodon KORMOS 1926
Pl. 1, Fig 2

1926 - *Amblycoptus oligodon* n. g. et n. sp. - KORMOS, p. 543. pl. 3. figs 1-5 (Polgárdi 2).
1980 - *Amblycoptus* cf. *oligodon* KORMOS 1926 - KRETZOI, p. 312 (Széchenyi Hill).
1996 - *Amblycoptus* cf. *oligodon* KORMOS 1926 - HÍR & MÉSZÁROS, p. 171, fig. 4 (Egyházasdengeleg).

Holotype: Left maxilla with five teeth, Geological Museum of Hungary (Geological Institute of Hungary), OB. 5071., Kormos (1926), p. 352, pl. 3 figs 1-5., Type locality: Polgárdi 2. (Hungary, Late Turolian, MN. 13).

Stratigraphic range: Late Miocene (Turolian, MN 12-13), Europe.

Studied material:

Széchenyi Hill: $1A^1$, $1I_1$ (V. 14044.)

Measurements: See Tab. 4.

		value	n.
A^1	L	1.91	1
	W	1.50	1
I_1	L	-	-
	H	1.27	1

Table 4. Measurements of *Amblycoptus oligodon* KORMOS 1926 from Széchenyi Hill

Description:

A^1 - This is a one-rooted, big tooth. The lingual and buccal cingulums are wide on the anterior, but narrow on the posterior part. The paracone is wide and high, without parastyle. The protocone is well developed, the metacone is thin. The posterior margin is slightly notched.

I_1 - The lower incisor is very much digested, the root is broken down, but the tooth is clearly acuspulate.

Remarks: In spite of the few present remains, the teeth are easily determinable. Among the similar genera, out of *Amblycoptus*, only *Paranourosorex* RZEBIK-KOWALSKA 1975 and *Kordosia* MÉSZÁROS 1996 has acuspulate lower incisor. The present species can be clearly divided from *Paranourosorex* by its much less dimensions. The A^1 without parastyle is a significantly different detail of *Amblycoptus oligodon* from *Kordosia*.

Relatively to the later Polgárdi ones, the paracone is wider and shorter, the protocone is bigger on the Széchenyi Hill A^1. In the present tooth the lingual margin of the paracone is concave, while in the later ones is convex. It seems a special evolutionary trend from the earliest occurrence of *A. oligodon* to the latest ones: the tooth becomes longer and mainly narrower. In the most evolved forms the paracone is like a cutting edge, wich perhaps played a prominent part in the changed nourishment.

Genus *Crusafontina* GIBERT 1974

Type species: *Crusafontina endemica* GIBERT 1974

Crusafontina endemica GIBERT 1974
Pl. 1, Fig. 3, Pl. 2, Fig 4

1975 - *Crusafontina endemica* GIBERT 1974 - Gibert, p. 118, figs 6, 7a, 7b (Can Llobateres).
1976 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - KRETZOI et al., p. 375 (Rudabánya).
1985 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - RABEDER, p. 447 (Rudabánya).
1991 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - KORDOS, p. 348 (Rudabánya).
1984 - *Amblycoptus vicinus* KRETZOI 1954 - KRETZOI, p. 215 (Sümeg).
1984 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - KRETZOI, p. 215 (Sümeg).
1996 a - *Crusafontina endemica* GIBERT 1974 - MÉSZÁROS, in press, a (Rudabánya, Sümeg).
1996 - *Crusafontina* aff. *endemica* GIBERT 1974 - MÉSZÁROS & ZIEGLER, in press (Rudabánya).

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

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

Studied material:

Sümeg-gerinc: 1 right maxillary fragment with P_4-M_1, 17 left and 25 right mandible fragments, 28 left I^1, 22 right I^1, 9 left A^1, 14 right A^1, 2 left A^2, 11

left P^4, 9 right P^4, 14 left M^1, 15 right M^1, 5 left M^2, 6 right M^2, 20 left I_1, 22 right I_1, 4 right A_2, 8 left M_1, 8 right M_1, 12 left M_2, 12 right M_2, 1 left M_3, 1 right M_3 The figured specimens: V. 20582. and V. 20583.

Measurements: See Tab. 5.

		min.	mean	max.	n.	s.e.	s.d.
I^1	L	2.37	2.48	2.62	8	0.0913	0.0992
	H	1.55	1.74	1.87	8	0.0838	0.1030
A^1	L	1.54	1.77	2.00	26	0.0796	0.1063
	W	1.00	1.08	1.18	26	0.0509	0.0582
A^2	L	1.08	1.10	1.03	2	0.0250	0.0250
	W	0.93	0.95	0.98	2	0.0250	0.0250
P^4	LL	1.25	1.40	1.64	13	0.0676	0.1030
	BL	2.10	2.35	2.55	13	0.0987	0.1200
	W	2.10	2.23	2.39	13	0.0555	0.0987
M^1	LL	1.74	1.91	1.98	12	0.0477	0.0651
	BL	1.88	2.09	2.17	12	0.0599	0.0791
	AW	1.96	2.17	2.28	12	0.0919	0.1050
	PW	2.05	2.19	2.33	12	0.0660	0.0772
M^2	LL	1.03	1.17	1.44	11	0.0924	0.1198
	BL	1.28	1.39	1.85	11	0.0519	0.0712
	AW	1.93	2.11	2.35	11	0.0862	0.0119
	PW	2.28	1.32	1.63	11	0.1010	0.1296
I_1	L	4.56	4.73	5.12	4	0.1975	0.2317
	H	1.12	1.16	1.19	4	0.0187	0.0249
A_2	L	1.29	1.37	1.55	6	0.0930	0.0570
	W	0.88	0.93	1.03	6	0.0570	0.0930
M_1	L	2.39	2.56	2.72	9	0.0986	0.1168
	W	1.24	1.29	1.34	9	0.0307	0.0341
M_2	L	1.54	1.77	1.86	3	0.0824	0.0704
	W	1.00	1.05	1.12	3	0.0499	0.0510
M_3	L	1.03	1.15	1.25	4	0.0824	0.0850
	W	0.30	0.59	0.75	4	0.0499	0.1715

Table 5. Measurements of *Crusafontina endemica* GIBERT 1974 from Sümeg-gerinc

Description: The detailed description and the comparisons are given in the special paper of the present author (MÉSZÁROS 1996, in press a) about this genus.

Remarks: In measurements the Sümeg *Crusafontina* material is between the Sümegian and Kochfidischian forms, but is closer to the latter.

Crusafontina vicina (KRETZOI, 1954)
Pl. 2, Fig. 5

1954 - *Amblycoptus vicinus* n. sp. - KRETZOI, p. 49 (Csákvár).
1970 - *Anourosorex kormosi* nov. spec. - BACHMAYER & WILSON p. 551, figs 3, 4, 4a, 20, 20a, 21, 22, 23, 23a, 24, 25 (Kochfidisch).
1978 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - BACHMAYER & WILSON, p. 141 pl. 2, figs, 5, 5a (Kochfidisch).
1978 - *"Anourosorex" kormosi* BACHMAYER & WILSON 1970 - STORCH, p. 424, pl. 4, figs 29-39 (Dorn-Dürkheim).
1980 - *Anourosorex kormosi* BACHMAYER & WILSON 1970 - BACHMAYER & WILSON, p. 361 (Kochfidisch).
1996 a - *Crusafontina vicina* (KRETZOI, 1954) - MÉSZÁROS, in press a, (Tardosbánya, Polgárdi 4).

Holotype: Left maxilla fragment with the incisor, two antemolars and a part of the alveole of the third one, Geological Museum of Hungary (Geological Institute of Hungary), V. 11417., KRETZOI (1954), p. 49. Type locality: Csákvár (Hungary, Early Turolian, MN 11).

Stratigraphic range: Late Miocene (Late Vallesian, MN 10 - Late Turolian, MN 13), Europe.

Studied material:
Csákvár, Esterházy Cave: the holotype (V. 11417.)

Measurements: See Tab. 6.

		value	n.
I^1	L	2.50	1
	H	1.86	1
A^1	L	2.05	1
	W	1.16	1
A^2	L	1.21	1
	W	1.02	1

Table 6. Measurements of *Crusafontina vicina* (KRETZOI, 1954) from Csákvár

Description: See in MÉSZÁROS 1996, in press a.

Remarks: This specimen was described by KRETZOI 1954 as the holotype of *Amblycoptus vicinus*, but without the morphological characters and figure. The first detailed description and the SEM photo of the specimen was given by MÉSZÁROS (1996, in press a), with the generic revision of the species. Some occurrences of Anourosorex kormosi BACHMAYER & WILSON are the synonymys of *Crusafontina vicina* (KRETZOI 1954). According to the measurements this sample is younger than Kochfidisch and Tardosbánya.

Tribe *Soricini* FISCHER VON WALDHEIM 1817
Genus *Blarinella* THOMAS 1911

Type species: *Blarinella quadraticauda* MILNE-EDWARDS 1872

Blarinella dubia (BACHMAYER and WILSON) 1970
Pl. 3, Fig. 6

partim 1954 - Soricidarum g. et sp. indet. II. - KRETZOI, p. 49. (Csákvár).
1970 - *Petenyia dubia* n. spec. - BACHMAYER & WILSON, p. 546. figs 6, 26, 27, 30, 31a (Kochfidisch).
? 1976 - *Petenyia dubia* BACHMAYER & WILSON 1970 - KRETZOI et al., p. 375 (Rudabánya).
1978 - *Petenyia dubia* BACHMAYER and WILSON 1970 - BACHMAYER & WILSON, p. 138. fig 18 (Kochfidisch).
1984 - *Petenyia dubia* BACHMAYER and WILSON 1970 - KRETZOI, p. 216 (Sümeg).
1984 - *Blarinella dubia* (BACHMAYER and WILSON) 1970 - REUMER, p. 66 pl. 20 figs 5-8 (Osztramos 9).
? 1985 - *Blarinella dubia* BACHMAYER & WILSON 1970 - RABEDER, p. 447 (Rudabánya).
1989 - *Blarinella dubia* (BACHMAYER and WILSON) 1970 - RZEBIK-KOWALSKA, p. 533 fig. 3 (Podlesice, Zalesiaki 1B).
? 1991 - *Blarinella dubia* BACHMAYER & WILSON 1970 - KORDOS, p. 348 (Rudabánya).
1995 - *Blarinella* cf. *dubia* (BACHMAYER and WILSON) 1970 - HÍR & MÉSZÁROS, p. 171, figs 3c-d (Egyházasdengeleg).

Holotype:

Left maxilla fragment with the three molars, Natural History Museum, Vienna, Div. Geol. Paleont., 1970/1387. (BACHMAYER & WILSON 1970, p. 546, figs 6, 26, 27, 30 and 31a.) Type locality: Kochfidisch (Austria, Late Vallesian, MN 10).

Stratigraphic range: Late Miocene (Early Turolian, MN 11 - Late Ruscinian, MN 14), Europe.

Studied material:

Sümeg-gerinc: 1 left mandible fragment with M_1-M_2, 1 left mandible fragment without teeth, 1 right condyle, 1 right I^1, 1 left A^1, 1 left A^2, 1 right M_1 right M^2, 1 left I_1, 1 right I_1 fragment, 1 right A_2, 1 left M_3. The figured specimens: V. 20584.

Csákvár, Esterházy Cave: 1 left mandible fragment with A_1-A_2, 1 left mandible fragment with M_3 (V. 11416.)

Measurements: See Tab. 7.

Description:

Mandible - The upper articular facet of the condyle is cylinder-shaped and makes an angle of about 45° whith the lower facet. The interarticular area is broad and centrally depressed. The lower facet has a concave upper and

lower edge. The mental foramen is placed between the protoconid and the hypoconid of M_1.

		Sümeg		Csákvár	
		value	n.	value	n.
I^1	L	1.90	1	-	-
	H	1.23	1	-	-
A^2	L	1.13	1	-	-
	W	0.87	1	-	-
M^1	LL	1.50	1	-	-
	BL	1.29	1	-	-
	AW	1.41	1	-	-
	PW	1.57	1	-	-
M^2	LL	1.31	1	-	-
	BL	1.29	1	-	-
	AW	1.52	1	-	-
	PW	1.39	1	-	-
I_1	L	3.62	1	-	-
	H	0.75	1	-	-
A_2	L	1.00	1	-	-
	W	0.86	1	-	-
M_1	L	1.49	1	-	-
	W	1.05	1	-	-
M_2	L	1.41	1	-	-
	W	0.82	1	-	-
M_3	L	1.15	1	1.25	1
	W	0.67	1	0.70	1

Table 7. Measurements of *Blarinella dubia* (BACHMAYER & WILSON, 1970) from Sümeg-gerinc and Csákvár

Teeth - There is a pigmentation on the anterior part of the lower incisor, the top of the apex and the talon of the upper incisor, and the cusps of the molars.

I^1 - The tooth is not fissident. The superior margin is straight or slightly concave. The posterior one is much convex, a wide buccal cingulum is present on it.

AA sup. - Only A^1 and A^2 are present in the studied material. A^1 is bigger than A^2. The paracone, the protocone and the hypocone are present on the first, but only the paracone and the protocone on the second antemolar.

M^1 and M^2 - They are quadrate shaped. M^1 is slightly bigger than M^2. On both teeth, the paracone is hardly lower than the metacone. The hypocone is not developed, the hypoconal flange is deeply excavated. The deep trigone basin is closed posteriorly by a metaloph. The posterior margin is slightly notched.

I_1 - The lower incisor is bicuspulate. The buccal cingulum is present only on the posterior part, but the lingual one is well developed.

AA inf. - A_1 is far less than A_2. A well developed cingulum is present on both sides of the lower antemolars.

M_1 and M_2 - The entoconid is situated very close to the metaconid and a high entoconid crest is present. The oblicristid-direct is between the protoconid and the metaconid. The postcristid runs behind the entoconid, the entostylid and the entoconid are separated by a wide valley. A cingulum is present on the buccal and the lingual side.

M_3 - The talonid is much reduced, only a single cusp is present, but the talonid basin is quite deep. The cingulum is developed only on the buccal side of the trigonid.

Remarks: In the synonymy list *B. dubia* occurres with question-mark in the Early Vallesian localities of Rudabánya quarry. This is on account of that KRETZOI et al.(1966) and after him RABEDER (1985) and KORDOS (1991) mention this taxa from the site. However MÉSZÁROS & ZIEGLER (1996, in press) studied an other sample from Rudabánya, they could not find *Blarinella* in the material. Unfortunately, the original material of KRETZOI et al.(1966) was not available for the later authors.

Subfamily and tribe Soricidae incertae sedis

The subfamiliar and tribal status of *Paenelimnoecus* is problematic. REUMER arranges it in the Allosoricini (1984), then in the Allosoricinae (1992), and gives a new diagnosis for the re-established subfamily. STORCH (1995) sees little justification for the inclusion of *Paenelimnoecus* in Allosoricines and ranges the taxon in Soricinae and leaves the tribal allocation open.

Genus *Paenelimnoecus* BAUDELOT 1972

Type species: *Paenelimnoecus crouzeli* BAUDELOT 1972

Paenelimnoecus repenningi BACHMAYER & WILSON 1970
Pl. 4, Fig. 7

1954 - Soricidarum g. et sp. indet. I. - KRETZOI, p. 49. (Csákvár).
partim 1954 - Soricidarum g. et sp. indet. II. - KRETZOI, p. 49. (Csákvár).
1970 - *Petenyiella ? repenningi* n. sp. - BACHMAYER & WILSON, p. 549, figs 7, 32, 32a, 33, 50, 50a (Kochfidish).
1978 - *Petenyiella ? repenningi* - BACHMAYER & WILSON, p. 139, fig. 3 (Kochfidish).
1984 - *Petenyiella repenningi* BACHMAYER & WILSON 1970 - KRETZOI, p. 216 (Sümeg).

Holotype:

Left lower jaw fragment with M_1-M_3, Natural History Museum, Wienna, Div. Geol. Paleont., 1970/1387., BACHMAYER & WILSON 1970, p. 549, figs 7,

32, 32a, 33, 50, 50a. Type locality: Kochfidisch (Austria, Late Vallesian, MN 10).

Stratigraphic range: Late Miocene (Early Turolian, MN 11 - Late Ruscinian, MN 13), Europe.

Studied material:

Sümeg-gerinc: 1 left mandible fragment, 3 right mandible fragments, 1 left P^4, 1 left M^1, 2 left I_1, 1 right M_1. The figured specimens: V. 20585.

Csákvár, Esterházy Cave: 1 left mandible fragment with M_1-M_3, 1 right I^1. (V. 11416.)

Measurements: See Tab. 8.

		Sümeg				Csákvár	
		min.	mean	max.	n.	value	n.
I^1	L	-	-	-	-	1.42	1
	H	-	-	-	-	1.20	1
P^4	BL	-	0.73	-	1	-	-
	LL	-	1.75	-	1	-	-
	W	-	1.25	-	1	-	-
I_1	L	2.21	2.28	2.35	2	-	-
	H	0.58	0.59	0.61	2	-	-
M_1	L	-	-	-	-	1.25	-
	W	-	-	-	-	0.61	-
M_2	L	-	1.11	-	1	1.11	-
	W	-	0.63	-	1	0.62	-
M_3	L	-	1.02	-	1	0.97	-
	W	-	0.52	-	1	0.50	-

Table 8. Measurements of *Paenelimnoecus repenningi* (BACHMAYER & WILSON, 1970) from Sümeg-gerinc and Csákvár

Description:

Mandible - Relatively to the oval upper condyloid facet, the oblong lower one is more extended. The interarticular area is narrow. The upper facet is parallel to the lower one. The coronoid process is high and narrow. The internal temporal fossa is subtriangular and higher than wide. The mandibular foramen is placed under the middle of the internal temporal fossa. The coronoid spicule is tiny. The mental foramen is situated under the middle of M_1.

I^1 - A slight buccal cingulum, but no buccal conule is present. The tooth is not fissident. The posterior margin is convex.

P^4 - It is much wider than long. There is no clearly devided protocone and hypocone on the ridge bordering the hypoconal flange. The parastyle is weak, the paracone is strong, its ridge is sharp. The hypoconal flange is deeply valleyed. The posterior emargination is well notched.

M^1 - The parastyle is broken on the studied specimen. The paracone is slightly lower than the metacone. The trigone basin is deep and is open posteriorly. The protocone is as high as the paracone. There is no separated hypocone on the ridge of the hypoconal flange. The talone basin is deep, the posterior emargination is notched.

I_1 - The present lower incisors are much digested, but they seem slightly bicuspulate.

M_1 and M_2 - The ectocingulid is week. The entoconid crest is absent. The postcristid direct is behind the entoconid, the entostylid is separated.

M_3 - The talonid is reduced to a single cusp. There is a week cingulid on the buccal side.

Remarks: The present form is distinguishable from the similar sized *Sorex minutus* by the different form of the condyle and the reduced talonid; from *Paenelimnoecus pannonicus* by the present entoconid of M_1 and M_2.

Soricidae gen. et sp. indet.
Pl. 4, Fig. 8

Studied material:
Sümeg: 1 left I^1 fragment, 1 right I^1. (V. 20586.)

Measurements: See Tab. 9.

		min.	mean	max.	n.
I^1	L	-	1.95	-	1
	W	1.02	1.07	1.12	2

Table 9. Measurements of Soricidae gen. et sp. indet. from Sümeg-gerinc

Description:
I^1 - The apex and the anterior part of the talone are concave, the posterior one is especially notched. There are no buccal cingulum and buccal conule at the posterior margin. The edge of the apex is S-shaped. The tooth is not bifid.

Conclusions

General remarks

Unfortunately the original material, described by KRETZOI (1954, 1980 and 1984) was not available in most cases for the author. There were surely more shrew specimens selected from the Sümeg material for KRETZOI then the present author, but it could not been found nowadays. Similarly the "Heterosoricinae sp." mentioned from the Széchenyi Hill sample was not

identificable in the collection of the Geological Museum of Hungary. Partly this causes that the present faunal lists differ from those of KRETZOI.

Taphonomy

However there were not taphonomical researches during the collecting work, we can get some information by the study of the remains.

KRETZOI (1984) mentions the Sümeg-gerinc fossil micro-bone sample as an accumulation of owl pellets. The quantity of the material (which was only partly seen by the author but was mentioned by KRETZOI) make us sure, that the animalian transport took very important part in the accumulation of the remains. But, the degree of the teeth corrosion (mainly the incisors), the very intensive breaking pattern of the bones and the great number of the isolated teeth suggest, that the soricids were killed and digested rather mammal predators then owls (Pl. 5, Fig. 9). This is supported by the great number of the carnivores in the fauna.

The taphonomy of the Széchenyi Hill material is more similar to the previous one. There are only a few shrew remains for the studies, but the enamel degradation is clearly visible on the surface of the *Amblycoptus* I_1, were only the dentin is present in the most part of the tooth (Pl. 1, fig. 2b).

The enamel surface on the Csákvár specimens is not digested, but the remains are fragmented, broken. It seems sure, that the transport by water played more important part in the accumulation, than in the case of the two other localities.

Stratigraphy

Based on the available soricids we can be sure that the assemblages are correlative with the Vallesian or the Turolian age. The occurred *Amblycoptus oligodon*, *Blarinella dubia*, *Paenelimnoecus repenningi*, and genus *Crusafontina* are the typical Late Miocene elements of the European fauna (Text fig. 2).

The presence of *Crusafontina vicina* suggests, that the geological age of Csákvár may not be earlier than Kochfidisch locality, Austria, the later part of MN 10 Zone, because this species does not appear before that. Only its ancestor, *C. endemica* occures in the MN 9 Zone (MÉSZÁROS, in press a). Based on the measurements, this sample is after Kochfidisch and Dorn-Dürkheim, MN 11 Zone (Text fig 3). We have to note that the chronological classification on the basis of the measurements is a little problematic in the case of Dorn-Dürkheim (see MÉSZÁROS, in press a).

Sümegian occurrence of *C. endemica* shows that the locality is older than Kochfidisch. On the basis of the measurements, this *Crusfontina* form may be intermediate between Rudabánya and Kochfidisch ones, but it is closer to the later. The possible age of Sümeg is from the upper part of the MN 9 to the lower one of the MN 10 Zone (Text fig 4).

The age of Széchenyi Hill has a great particularity in the determination of the time of the tectonic movements in the Buda Mountains and the surrounding areas. According to the former chronological classifications the locality was arranged in the lower part of the MN 12 Zone. *A. oligodon*, mentioned only in the latest part of the Turolian Age (MN 13), suggests that the fauna of this karst fissure to be correlative with the MN 13 or at least the end of the MN 12 Zone. The age of this assemblage is certainly younger than the Hungarian locality of Tardosbánya, wich is before the FAD of the named species (MÉSZÁROS, in prep. a) (Text fig 2). The measurements suggest, that the Széchenyi Hill material is very close to the Polgárdi 4 one (MÉSZÁROS, in prep, b) but is somewhat older (Text fig. 5).

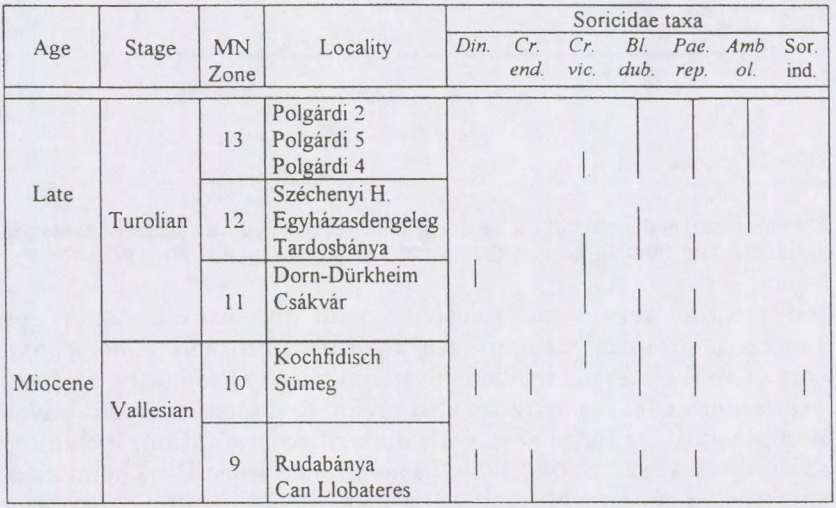

Fig. 2. Stratigraphical occurrence of the studied Soricidae taxa

Palaeoecology

Because of the climatic turnover, there was a great change in the Soricidae fauna of Europe during the Late Miocene (RZEBIK-KOWALSKA 1995). The somewhat colder and most arid climate caused the disappearance of many small sized Crocidosoricinae shrews with the immigration of Soricinae ones.

While the larger mammals and and rodents show mainly a steppe vegetation in the Late Miocene of Central Europe, the soricids indicate not so open environments. Their occurrences in most cases connect with somewhat more humid microclimates in mountain areas or by local water bodies. The Crocidurinae, wich are adaptated to quite dry climate, are not present among the shrews. On the other hand, the relation of the subfamilies in the fossil shrew assemblages indicate not so warm and humid climate as

in the Middle Miocene. There are no Crocidosoricinae, only few or no Heterosoricinae, but numerous Soricinae in the samples.

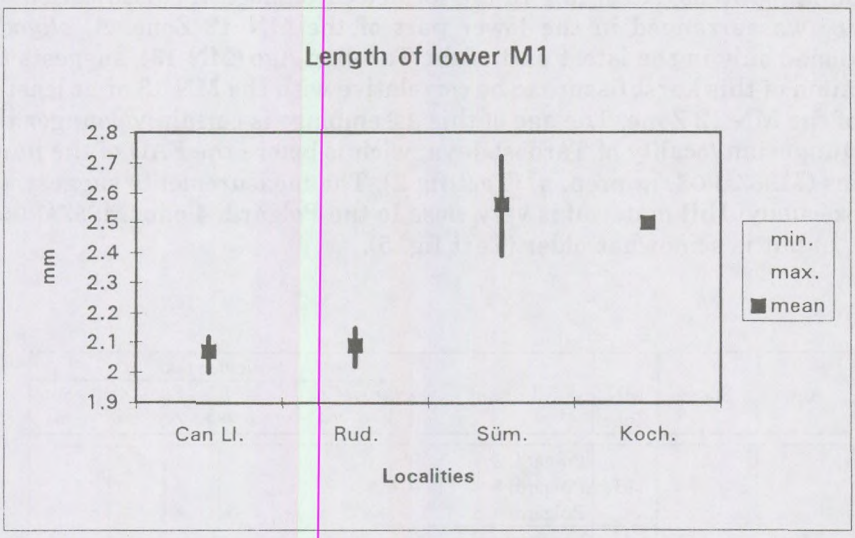

Fig. 3. The comparative diagram of the M_1 length of *Crusafontina*; the measurements are after MÉSZÁROS & ZIEGLER 1996, in press, GIBERT 1975 and BACHMAYER & WILSON 1970

Based on the very close relativity with the extant Asian species, *Anourosorex squamipes* we can see *Crusafontina* and *Amblycoptus* as indicators of well watered, wooded environments. *Crusafontina* is described from forested or at least partly wooded areas. Rudabánya should have been a basin of a relatively large area with diversified vegetation, including also forests (KORDOS, 1982). STORCH (1978) mentioned Dorn-Dürkheim as a well watered, forested biotope. Although, BACHMAYER & WILSON (1970) described Kochfidisch, as a largely open grassland, but with local bodies of water and restricted woodland areas. We do not now much about the ecology of the localities, in which material *Amblycoptus* occurred, but some datas seem to suggest, that it may have inhabited the same environment, as *Anourosorex* and *Crusafontina*.

Blarinella dubia and *Paenelimnoecus repenningi* are present in the European Soricidae fauna, after the climatic and faunal change at the beginning of the Late Miocene. Both genera have extant members in the mountain forests of Asia. We can suppose, that the named fossil species indicate similar habitats as those of their recent relatives.

The soricid fauna suggests that all the three studied localities were well watered, forested areas, in a mountain region or by a larger water body. The other fauna elements indicate either open karst areas or open water surfaces in the surroundings. On the basis of the subfamiliar relation of the samples the general climate seems relatively most arid and cooler to the Middle

Miocene, but not too extreme. This view is supported by the occurrence of many steppe taxa in the samples.

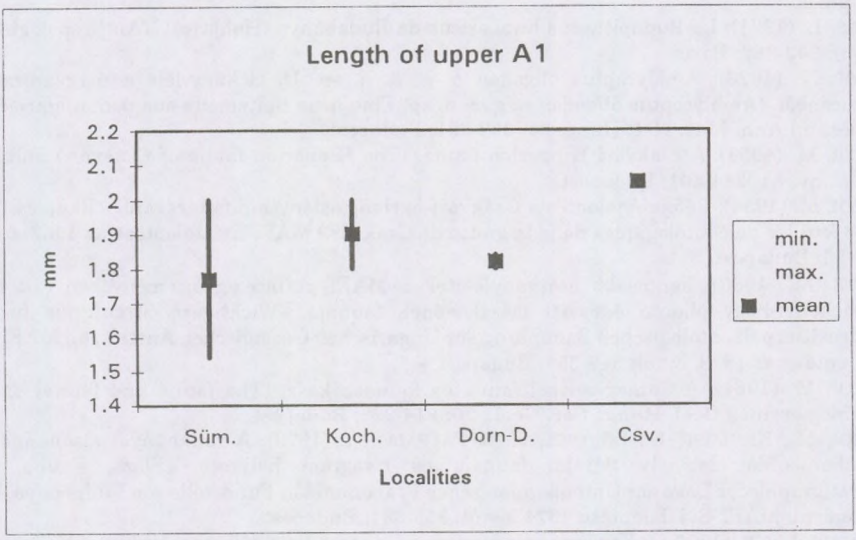

Fig. 4. The comparative diagram of the A^1 length of *Crusafontina*; the measurements are after BACHMAYER & WILSON 1970 and STORCH 1978

Acknowledgements

I am very much indebted to Prof. László Kordos, director of the Geological Museum of Hungary, Budapest, for the chance to study the material published in the present paper, as well as to Dr. Gudrun Daxner-Höck (Natural History Museum, Vienna) for her kind assistance in study the comparative material from the Austrian locality of Kochfidisch, mainly the type material of *Blarinella dubia* and *Paenelimnoecus repenningi*. I thank to Prof. Miklós Monostori, the head of the Department of Palaeontology, Eötvös Loránd University, Budapest, for the help in making the SEM photos.

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In preparation

a - MÉSZÁROS, L. GY.: Late Miocene Soricidae (Mammalia, Insectivora) remains from Tardosbánya (Western Hungary).
b - MÉSZÁROS, L. GY.: An exceptionally rich Soricidae (Mammalia, Insectivora) fauna from the Late Miocene localities of Polgárdi quarry (West-Hungary).

Három dunántúli felső miocén lelőhely Soricidae (Mammalia, Insectivora) faunája

MÉSZÁROS Lukács György

A jelen cikkben szereplő három nyugat-magyarországi fosszílialelőhely mindössze néhány cickány maradványt szolgáltatott. A leletek mégis nagy jelentőségűek a hazai Soricidae kutatás számára, mert ebből a korból Magyarországról alig néhány ilyen lelőhelyet ismerünk. Az itt ismertetett karsztkitöltések Soricidae faunája nemcsak azért fontos, mert felvilágosítást ad ezen rendszertani csoport igen mozgalmas felső miocénbeli történetéről, de új adalékokat szolgáltat a lelőhelyek pontosabb geológiai korának és palaeoökológiai viszonyainak meghatározásához is.

A vizsgált mintákból a következő taxonok kerültek meghatározásra:

Sümeg-gerinc, kőfejtő

Dinosorex sp.
Crusafontina endemica (GIBERT, 1974)
Blarinella dubia (BACHMAYER & WILSON, 1970)
Paenelimnoecus repenningi (BACHMAYER & WILSON, 1970)
Soricidae gen. et sp. indet.

Csákvár, Esterházy-barlang

Crusafontina vicina (KRETZOI, 1954)
Blarinella dubia (BACHMAYER & WILSON, 1970)
Paenelimnoecus repenningi (BACHMAYER & WILSON, 1970)

Széchenyi-hegy, Svájci út 14

Amblycoptus oligodon KORMOS 1926

Bár a fauna begyűjtése során nem végeztek tafonómiai felméréseket, maguk a maradványok nyújtanak némi információt a felhalmozódás körülményeiről. KRETZOI (1984) szerint a sümeg-gerinci lelőhely kisemlős maradványai csak úgy halmozódhattak fel ilyen nagy tömegben, ha az

üledékgyűjtő karsztüreg közelében baglyok ülőfái voltak, amelyek lehulló köpeteiből képződhetett a vastag "kisemlős-réteg". A csontok és a fogak nagy mennyisége valóban állati transzportra utal. Az intenzív törési mintázat és a nagyfokú emésztettség alapján azonban az tűnik valószínűbbnek, hogy emlős ragadozók halmozták össze az anyagot. Ezt a faunában sűrűn előforduló Carnivorák is alátámasztják. A széchenyi-hegyi anyag felhalmozódása hasonló lehetett a sümeg-gerincihez. A csákvári maradványokon sokkal kisebb fokú az emésztettség, de a csontok töredékesek, sok a különálló fog. Az utóbbi esetben a víz által végzett szállítás nagyobb szerepet játszhatott a felhalmozódásban, mint az állati transzport.

A meghatározásra került Soricidae taxonok alapján a lelőhelyek kora bizonyosan késő miocén: az *Amblycoptus oligodon*, a *Blarinella dubia*, a *Paenelimnoecus repenningi*, és a *Crusafontina* tipikus képviselői ennek az időnek. A *C. endemica*, *C. vicina* és *A. oligodon* előfordulások, valamint a méretek alapján a lelőhelyek legvalószínűbb sztratigráfiai helyzete a következő:

Sümeg: Vallesien, MN 10, némileg idősebb, mint az ausztriai Kochfidisch lelőhely.

Csákvár: Vallesien, MN 11, fiatalabb, mint a németországi Dorn-Dürkheim.

Széchenyi-hegy: Turolien, MN 12 Zóna legfiatalabb vagy MN 13 Zóna legidősebb része, Tardosbánya és Polgárdi közti időszak.

Paleoökológiai szempontból a cickány fajok azt a megváltozott képet tükrözik, amely a középső-felső miocén határ után jellemzi Európát: a lehűlő és szárazodó klíma hatására eltűnnek a kisméretű Crocidosoricinaek, megritkulnak a Heterosoricinaek, helyüket átveszik az Ázsiából bevándorló Soricinaek. Bár a faunában előfordulnak sztyeppei elemek is, a cickányok ennél valamivel nedvesebb környezetre utalnak. A Soricidae társulás, összevetve egyéb faunaelemekkel, száraz éghajlaton, lokális, nyílt víztesthez vagy hegyvidéki környezethez kapcsolódó, jó vízellátottságú, erdei ökotópot jelez.

Plate 1

Figure 1. *Dinosorex* sp. from Sümeg-gerinc. a: left M_3, b: right M_3 (V. 20581.)

Figure 2. *Amblycoptus oligodon* KORMOS 1926 from Széchenyi Hill. a: left A^1, b: right I_1 (V. 14044.)

Figure 3. *Crusafontina endemica* GIBERT 1974 from Sümeg-gerinc. a: left I^1, b: left A^1, c: left A^2, d: left P^4, e: right M^1 (V. 20582.)

Plate 2

Figure 4. *Crusafontina endemica* GIBERT 1974 from Sümeg-gerinc. a: right M_1, b: left M_2, c: right M_2, d: left I_1 (V. 20583.)

Figure 5. a-b: the holotype of *Crusafontina vicina* (KRETZOI, 1954) from Csákvár (V. 11417.)

Plate 3

Figure 6. *Blarinella dubia* (BACHMAYER & WILSON, 1970) from Sümeg-gerinc. a: right I^1, b: right condyle, c: left A^1, d: left A^2, e: right M^1, f: right M^2, g: left M^3 (V. 20584.)

Plate 4

Figure 7. *Paenelimnoecus repenningi* (BACHMAYER & WILSON, 1970) from Sümeg-gerinc. a: left P^4, b: left M^1, c: left I_1, d: left condyle (V. 20585.)

Figure 8. Soricidae gen. et sp. indet. from Sümeg-gerinc. a: left I^1, b: right I^1 (V. 20586.)

Figure 9. Digested shrew incisors from Sümeg-gerinc. a-b: *Crusafontina endemica* GIBERT 1974 (V. 20587.)

Annales Univ. Sci. Budapest., Sect. Geol. 31, 27—74 & 123–144 (1996) Budapest

Eocene ostracods of Hungary Systematical part 1. (Cytheracea 1.)

(OTKA Project T 014292)

Miklós MONOSTORI[1]

(with 22 plates)

Abstract

This work is the first part of a monograph describing the ostracod fauna of the Eocene sediments of Hungary. It contains the descriptions of the following Cytheracea species: *Cytheromorpha zinndorfi hungarica* MONOSTORI, 1985, *Paijenborchella eocaenica* TRIEBEL, 1949, *Paijenborchella* aff. *eocaenica* TRIEBEL, 1949, *Paijenborchella lomata* TRIEBEL, 1949, *Cytheridella gantensis* MONOSTORI, 1977, *Clithrocytheridea faboides gantensis* MONOSTORI, 1977, *Clithrocytheridea kosdensis* n. sp., *Clithrocytheridea* sp., 1, *Neocyprideis williamsoniana* (BOSQUET, 1952), *Cytheridea fraudator* MONOSTORI, 1985, *Schuleridea mirkmalovi* SAKINA, 1971, *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838), *Schuleridea* aff. *perforata* (ROEMER, 1838), *Monsmirabilia kosdensis* n. sp., *Monsmirabilia triebeli* KEIJ, 1957, *Monsmirabilia* n. sp. 1, *Krithe angusta* DELTEL, 1961, *Krithe bartonensis* (JONES, 1857) s.l., *Krithe* aff. *curvidorsalis* MANDELSTAM *in* ROSYEVA, 1962, *Krithe kollmanni* POKORNÝ, 1980, *Krithe parapernoides* n. sp., *Krithe pernoides* (BORNEMANN, 1855), *Parakrithe* aff. *costatomarginata* MONOSTORI, 1982, *Turmaekrithe fragilis* PIETRZENIUK, 1969, *Trachyleberis spinosa* LIENENKLAUS, 1900, *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) s.l., *Phalcocythere horrescens* (BOSQUET, 1852), *Phalcocythere budakesziensis* n. sp., *Phalcocythere sumegensis* n. sp., *Costa* cf. *hermi* WITT, 1967, *Costa* sp.1, *Agrenocythere ordinata* (DELTEL, 1961), *Hazelina indigena* MOOS, 1966, *Horrificiella aculeata aculeata* (BOSQUET, 1852), *Horrificiella aculeata modesta* HINTE, 1962, *Pterygocythere jonesi* (MÉHES, 1936), *Echinocythereis dadayana* (MÉHES, 1941), *Echinocythereis* sp. 1, *Echinocythereis* sp. 2, *Echinocythereis* sp. 3, *Henryhowella asperrima* (REUSS, 1850) s.l., *Leguminocythereis dudarensis* MONOSTORI, 1987, *Leguminocythereis inflata* DUCASSE, 1963, *Leguminocythereis pertusa erasiforma* n. ssp., *Leguminocythereis striatopunctata angulata* n. ssp.

[1]Department of Palaeontology, Eötvös University, H–1083 Budapest, Ludovika tér 2, Hungary

Systematical part 1. (Cytheracea 1.).

Cytheracea BAIRD, 1850 superfamilia
Cytheridae BAIRD, 1850 familia
Cytherinae BAIRD, 1850 subfamilia
Cytherini BAIRD, 1850 tribus
Cytheromorpha HIRSCHMANN, 1909 genus

Cytheromorpha zinndorfi hungarica
MONOSTORI, 1985
Pl. 1, f. 1–7

1985a. *Cytheromorpha zinndorfi hungarica* n. ssp. - MONOSTORI, pp. 37-40, Pl. III. f. 1-8.

Remarks: Riblets connected to the eye tubercle are thickened. The pronouncing of the posterior ends of the ventral and dorsal swellings is variable. There is a vertical triangular sulcus dorsally at 0.4 length between the muscle scar area and the dorsal outline.

Dimensions: Adult carapaces: L = 0.27-0.40 mm, H = 0.15-0.24 mm, L/H = 1.53-1.92, W = 0.12-0.18 mm

Occurrence: Budapest Area: Budakeszi 6 borehole 114.5-116.5 m. Dorog Area: Ótokod-pit samples A9-A10; Tokod 527 borehole 206.8-252.2, 345.0-352.2 m; Csolnok 699/b borehole 534.0-539.0 m; Esztergom 81 borehole 248.5-290.4 m. Mány Area: Csabdi 74 borehole 276.2-296.5 m; Csordakút 115 borehole 249.0-386.0-427 m; Mány 55 borehole 478.5-516.0 m; Mesterberek 75 borehole 365.0-376.0 m; Mesterberek 76 borehole 290.7-439.3 m; Mesterberek 78 borehole 387.0-396.0 m; Mesterberek 81 borehole 168.0, 214.0-215.0 m; Mesterberek 88 borehole 294.0; Mesterberek 118 borehole 321.2-396.0 m; Mesterberek 180 borehole 131.2-151.6 m. Tatabánya 1481 borehole 291.9-295.5 m; (cf. *zinndorfi hungarica*).

Material: 3517 carapaces, 7 right valves, 8 left valves, 28 fragments.

Stratigraphical range in Hungary: Lutetian-Bartonian Lower Priabonian?

Paijenborchellini DEROO, 1960 tribus
Paijenborchella KINGMA, 1948 genus

Paijenborchella eocaenica TRIEBEL, 1949
Pl. 2, f. 1–6

1949. *Paijenborchella eocaenica* n. sp. - TRIEBEL, pp. 196-198. Pl. 1. f. 1-7., Pl. 2. f. 8.
Cum syn. 1985a. *Paijenborchella eocaenica* TRIEBEL, 1949 - MONOSTORI, pp. 46-48., Pl. IV., f. 17-18.
1957. *Paijenborchella longicosta* n. sp. - KEIJ, p. 156., pl. XXI., f.1-4.
1971. *Paijenborchella longicosta* KEIJ, 1957 - HASKINS, p. 220., Pl. 1., f. 23-24.
1985. *Paijenborchella eocaenica* TRIEBEL, 1949 - DUCASSE et al., Pl. 74., f. 7.

Remarks: there is an anterior - anteroventral flange with radial fibrous structure as it is visible on TRIEBEL's original figures. Sometimes a circummarginal row of small knots is visible anteroventrally. The shape is rather variable, the elongate forms have trapezoidal dorsal and nearly straight ventral outlines, the more stubby forms (females ?) have more arched outlines. The surface is covered by small pits. There are intermediate forms between the *eocaenica* and *longicosta* as written already by KEIJ (1957) and I consider the latter as a variation of the *eocaenica*.

Dimensions: adult carapaces: L = 0.40-0.50 mm, H = 0.19-0.26 mm, W = 0.22-0.23 mm, L/H = 1.83-2.38, (most frequent: 1.90-2.10)

Occurrence: Cserhát Area: Kósd 20 borehole 110.2-137.3 m. Dorog Area: Tokod 527 borehole 206.8-210.2 m; Nyergesújfalu 31 borehole 199.5-228.7 m. Mány Area: Csordakút 113 borehole 350 m; Csordakút 115 borehole 381 m; Mány 55 borehole 424.0-476.8 m; Mesterberek 46 borehole 94.2-94.6 m; Mesterberek 75 borehole 279.0-283.5 m; Mesterberek 76 borehole 304.4-388.5 m, Mesterberek 81 borehole 145.0-152.0 m; Mesterberek 118 borehole 308.0-316.4 m; Mesterberek 180 borehole 68.0-106.0 m; Tatabánya area: Tarján 8 borehole 242.7-257.4 m.

Material: 182 carapaces.

Stratigraphical distribution without Hungary: England and Belgium: Ledian-Bartonian, France: Lutetian-Ledian, Germany: Upper Eocene(?), Ukraina: Upper Eocene.

Stratigraphical range in Hungary: Middle to Upper Eocene.

Paijenborchella aff. *eocaenica* TRIEBEL, 1949
Pl. 2, f. 7–8.

Remarks: The form and ornamentation are similar to *eocaenica,* but the ridges are very strong, high, keel like and the pits are often larger. Flange with radial structure is common.

Dimensions: adult carapaces: L = 0.54-0.56 mm, H = 0.25-0.30mm, W = 0.23-0.28 mm, L/H = 1.88-2.14

Occurrence: Budapest Area: Budakeszi 6 borehole 114.5-152.2 m

Material: 18 carapaces

Stratigraphical range in Hungary: Lower Priabonian.

Paijenborchella lomata TRIEBEL, 1949
Pl. 3, f. 1–3.

1949. *Paijenborchella lomata* n. sp. - TRIEBEL, pp. 198-199., Pl. 2.. f. 9.
1957. *Paijenborchella lomata* TRIEBEL, 1949 - KEIJ, p. 156., Pl. XXI. f.5.
1961. *Paijenborchella lomata* TRIEBEL, 1949 - DELTEL, pp. 106-107., Pl. 12. f. 199.
1969. *Paijenborchella lomata* TRIEBEL, 1949 - PIETRZENIUK, p. 103., Pl. XXII., f. 26-27.
1969. *Paijenborchella lomata* TRIEBEL, 1949 - SCHEREMETA, p. 173., Pl. XIV., f. 14.
1969. *Paijenborchella lomata* TRIEBEL, 1949 - DUCASSE, pp. 85-86., Pl. VI., f. 121.
1971. *Paijenborchella lomata* TRIEBEL, 1949 - HASKINS, p. 220., Pl. 1., f. 10-18.

1971. *Paijenborchella (Eopaijenborchella) lomata* TRIEBEL, 1949 - MOOS, pp. 75-76., Pl. 9., f. 8-10.
1977. *Paijenborchella? lomata* TRIEBEL, 1949 - SZCZECHURA, p. 81., Pl. 32., f. 4-5.
1977. *Paijenborchella lomata* TRIEBEL, 1949 - WILLEMS, pp. 199-200., Pl. I., f. 3-4.
1985a. *Paijenborchella* cf. *lomata* TRIEBEL, 1949 - MONOSTORI, p. 48.
1985. *Paijenborchella lomata* TRIEBEL, 1949 - DUCASSE et al., Pl. 74., f. 9-10.

Remarks: The strong anterior spines and knots, the strong posteroventral spine near the end of the double ventral ridge and the large pits on the posterior lateral surface are very characteristic elements.

Dimensions: adult carapaces: L = 0.50-0.60 mm, H = 0.24-0.39 mm, W = 0.19 mm, L/H = 1.95-2.33 (mainly 1.95-2.10)

Occurrence: Dorog Area: Nyergesújfalu 31 borehole 238.0-239.5 m. Mány Area: Csabdi 74 borehole 276.2-282.6 m; Csordakút 115 borehole 381.0 m; Mány 55 borehole 430.0-485.0 m; Mesterberek 76 borehole 322.1-388.0 m; Mesterberek 81 borehole 153.0 m; Mesterberek 118 borehole 313.4-315.4 m. Mór-Tatabánya Area: Mór 16 borehole 66.6-66.9 m; Tatabánya 1481 borehole 129.8-130.7 m.

Material: 105 carapaces.

Stratigraphical distribution without Hungary: England: Lower Eocene; Belgium: Bartonian; Netherlanden, Poland, Ukraina: Upper Eocene; France: Lower to Middle Eocene; Germany: Middle to Upper Eocene.

Stratigraphical range in Hungary: Middle Eocene.

Paijenborchella sp. div.

Remarks: Poorly preserved specimens belonging to genus *Paijenborchella.*

Occurrence: Budapest Area: Budapest, Vár-Hill. Mány Area: Csordakút 115 borehole 383.0 m; Mány 55 borehole 436.0-493.0 m; Mesterberek 76 borehole 315.5-389.5 m; Mesterberek 81 borehole 150.0-154.0 m; Mesterberek 118 borehole 310 m. Tatabánya Area: Oroszlány 2370 borehole 604.0 m.

Material: 15 carapaces.

Stratigraphical range in Hungary: Middle Eocene.

Limnocytheridae KLIE, 1838 familia
Metacypridinae DANIELOPOL, 1965 subfamilia
Cytheridella DADAY, 1905 genus

Cytheridella gantensis MONOSTORI, 1977
Pl. 3, f. 4.

1977. *Cytheridella gantensis* n. sp. - MONOSTORI, pp. 95-96., Pl. II. f. 15-17.
1993. *Cytheridella gantensis* MONOSTORI, 1977 - MONOSTORI, pp. 107-112., Pl. 1., f. 1-4.,6-7.

Dimensions: adult right valve: L = 0.76-0.77 mm, H = 0.35-0.37 mm, L/H = 2.08-2.17. Left valve: L = 0.78-0.80 mm, H = 0.35-0.39 mm, L/H = 2.05-2.23.

Occurrence: Mór-Tatabánya Area: Gánt, Bagolyhegy-pit
Material: 8 right valves, 3 left valves.
Stratigraphical range in Hungary: Middle Eocene (Bartonian).

Cytherideidae SARS, 1925 familia
Cytherideinae SARS, 1925 subfamilia
Clithrocytheridea STEPHENSEN, 1936 genus

Clithrocytheridea faboides gantensis MONOSTORI, 1977
Pl. 3, f. 5–8, Pl. 4, f. 1–8.

1977. *Clithrocytheridea faboides gantensis* n. sp. - MONOSTORI, pp. 83-85., Pl. II. f. 2-4.
1985a. *Clithrocytheridea faboides gantensis* MONOSTORI, 1977 - MONOSTORI, pp. 49-52., Pl. IV. f. 19-26., Pl. V. f. 1-5.
1987. *Clithrocytheridea faboides gantensis* MONOSTORI, 1977 - MONOSTORI, p. 143., Pl. 3. f. 7-8.

Remarks: There is a wide variation of the shape. On the left valve the ventral outline may be nearly straight or slightly convex. The dorsal outline straight or slightly concave, the posterior outline asymmetrically rounded. The degree of converging of the ventral and the dorsal outlines is variable from nearly parallel to distinctly convergent.

The ornamentation shows a wide variation too; the surface is densely or more scatterely pitted, the large pitts are round or gently elongated.

The shape of the right valve is also variable. The shape mentioned in the type description (1977) characteristic for the elongated specimens, at the shorter ones the dorsal outline is arched, the turns between the anterior/dorsal and dorsal/posterior outlines are more gradual, sometimes the dorsal outline forms a nearly symmetrical arch.

In spite of the wide variation it seems necessery to preserve the distinct subspecies because in the Hungarian material there are no left valves with distinclty concave ventral outline and the vestibulum is more deep.

Dimensions adult carapaces: L = 0.37-0.52 mm, H = 0.22-0.29 mm, W = 0.17-0.23 mm, L/H = 1.62-2.11

Occurrence: Dorog Area: Tokod, Ebszőnyi csárda outcrop; Ótokod-pit samples A1 - B6; Bajót-Búzáshegy ravine samples 1-11; Tokod 527 borehole 210.2 - 254.7 m; Csolnok borehole 296.4 - 329.4 m; Csolnok 699/b borehole 522.6 - 532.0 m; Esztergom 81 borehole 279.4 - 290.4 m; Nyergesújfalu 31 borehole 2373 - 286.8 m. Mány Area: Csabdi 74 borehole 260.0 - 280.4 m; Csordakút 113 borehole 293.0 - 345.0 m; Csordakút 115 borehole 378.0 m; Mány 55 borehole 431.0 - 472.6 m; Mesterberek 75 borehole 302.0 - 356.0 m; Mesterberek 76 borehole 312.4 - 387.0 m; Mesterberek 81 borehole 142.0 - 210.0 m; Mesterberek 88 borehole 284.4 m; Mesterberek 118 borehole 313.4 - 384.7 m; Mesterberek 180 borehole 80.6 - 107.0 m. Mór-Tatabánya Area: Tatabánya 1481 borehole 123.4-181.0 m. Gánt, bauxite-pit. Bakony Area: Dudar, coal-mine;

Material: 134 left valves, 79 right valves, 753 carapaces, 26 fragments

Stratigraphical range in Hungary: Middle Eocene

Clithrocytheridea kosdensis n. sp.
Pl. 5, f. 1–4.

Derivatio nominis: after the type locality
Holotypus: carapace
Locus typicus: Kósd, N.Hungary
Stratum typicum: Priabonian
Diagnosis: Elongated form with nearly symmetrical and broadly arched posterior outline of the left valve.

Description: The anterior outline of the left valve is asymmetrical, the radius of its dorsal part is much larger and at about 0.4 of the length it turns into the straight dorsal outline after a 150-160° break. The dorsal outline is fairly concergent with the ventral. It rapidly turns into the broad and nearly symmetrical posterior outline after 0.9 of the length. The ventral outline is nearly straight. There is a characteristic denticulation on the ventral part of the anterior outline and a more weak denticulation on the ventral part of the posterior outline.

On the right valve the anterior outline is more asymmetric, the turn of the anterior and dorsal outline has 130-140° angle, the dorsal and ventral outlines are more convergent, the posterior outline is distinctly asymmetrical, the ventral outline is slighty concave. The anteroventral denticulation is characteristic.

In the dorsal view of the carapace the surface rises to the 0.4 of the length with 45-0° angle, then it is nearly parallel with the symmetry plan of the carapace to 5/6 of the length, then after a break slopes with about 40° angle to the posterior end.

Ornamentation: Dense little pits are on the surface, near the outlines they have distinctly concentrical arrangement, anterior and dorsally there are characteristic concentrical wrinkles. The strength of the ornamentation is variable. The median and dorsal surface may be smooth. In the hinge of the left valve between the stronngly crenulated long sockets there is a crenulated bar. The inner lamella anteriorly is very wide. Other inner features are'nt visible.

Dimensions: adult carapaces: L = 0.50 - 0.60 mm, H = 0.24 ,- 0.29 mm, L/H = 1.77 - 2.20, W = 0.22 - 0.25 mm

Comparison: The new species is similar to the males of the *Cl. faboides gantensis,* but differs from it in more symmetrical posterior outline and more fine pitting and wrinkling.

Occurrence: Cserhát Area: Kósd 20 borehole 124.4 - 147.4 m
Material: 15 left valves, 9 right valves, 117 carapaces
Stratigraphical range inn Hungary: Lower Priabonian.

Clithrocytheridea sp. 1
Pl. 5, f. 5.

Remarks: Large form, with distinctly concave ventral outline of the right valve. Its posterior outline is narrowly arched, so the posterior part of the right valve somewhat curved downwards. It may by a new species or a rare variation of the *Cl. faboides gantensis.*

Dimensions: adult carapaces: L = 0.55 - 0.64 mm, H = 0.28 - 0.34 mm, L/H = 1.74 - 2.30, W = 0.28 mm

Occurrence: Mány Area: Mesterberek 76 borehole 338.0 m; Mesterberek 78 borehole 377.0 m; Mesterberek 118 borehole 358.8 m

Material: 11 carapaces.

Stratigraphical range in Hungary: Middle Eocene (Bartonian).

Neocyprideis APOSTOLESCU, 1956 genus

Neocyprideis williamsoniana (BOSQUET, 1852)
Pl. 5, f. 6–8.

1852. *Cytheridea williamsoniana* n. sp. - BOSQUET, pp. 43-44., Pl. II. F.6.
cum syn. 1985a. *Neocyprideis williamsoniana* (BOSQUET, 1952) - MONOSTORI, pp. 52-53, Pl. V., f. 6-7.
1957. *Cyprideis (Goerlichia) apostolescui* n. sp. - KEIJ, p. 72., Pl. VII., f. 9-15.
? 1960. *Cyprideis (Neocyprideis) apostolescui* (KEIJ, 1957) - MEHROTA, p. 78., Pl. 1., f. 1-2.
1969. *Cyprideis (Neocyprideis) apostolescui* (KEIJ, 1957) - HASKINS, p. 155., Pl. 3., f. 9-11.
1969. *Neocyprideis apostolescui* (KEIJ, 1957) - DUCASSE, p. 60., Pl. IV., f. 78.
1978. *Neocyprideis williamsoniana* (BOSQUET, 1852) - KEEN, Pl. 5., f. 2-4.
? 1980. *Neocyprideis apostolescui* (KEIJ, 1957) - OLTEANU, Pl. 1., f. 7-8.
1984. *Neocyprideis* cf. *apostolescui* (KEIJ, 1957) - GUERNET, p. 122., Pl. 1., f. 15-17.
1985. *Neocyprideis* cf. *apostolescui* (KEIJ, 1957) - DUCASSE et al., Pl. 75., f.4.
1985. *Neocyprideis williamsoniana* (BOSQUET, 1852) - DUCASSE et al., Pl. 75., f.5.
1987. *Neocyprideis williamsoniana* (BOSQUET, 1852) - MONOSTORI, pp. 143-144., Pl. 3., f.9.

Remarks: Pitted and smooth specimens are together in some materials. The ornamentation is the main species character in Keij's diagnnosis apart from a minor difference in the hinge. I think we have a variable species including *williamsoniana* and *apostolescui.* The forms of MEHROTA (1960) and OLTEANU (1980) have too simple drawings to compare. Form with phenotypical knots is only in a single sample with rather high (26) specimen number.

Dimensions: adult carapaces: L = 0.67 - 0.74 mm, H = 0.38 - 0.50 mm, L/H = 1.50 - 1.75.

Occurrence: Dorog Area: Ótokod-pit sample A2, Csolnok borehole 258.3 - 259.0 m; Mány Area: Tabajd 7 borehole 178.2 - 178.4 m; Mór-Tatabánya Area: Gánt bauxite pit, Bakony Area: Dudar coal mine.

Material: 17 carapaces, 10 left valves, 9 right valves, 7 fragments.

Stratigraphical distribution without Hungary: Lutetian to Rupelian of England, Belgium, France.

Stratigraphical range in Hungary: Middle Eocene.

Cytheridea BOSQUET, 1852 genus

Cytheridea fraudator MONOSTORI, 1985
Pl. 6, f. 1–8.

1985a. *Cytheridea fraudator* n. sp. - MONOSTORI, pp. 54-56., Pl. V., f. 8-16.

Remarks: the *Hemicyprideis helvetica* (LIENENKLAUS, 1895) follow this species in the Lower Oligocene. Its very similar shape and ornamentation suggest a line descended from *Cytheridea* during change of the hinge. It happened in a mixohalin environment and the *Hemicyprideis* is a typical and common form of the brackish Oligocene and Miocene in Hungary.

The pattern of the phenotypical knots is rather regular, only their existence or strength is phenotypical. On the right valve there is a small anterior knot, a larger knot at the cardial angle a large knot below it, a large knot posterodorsally, a very small knot at the anteroventral angle and a long and arched, sometimes keel-like ventral swelling. There is a vertical dorsal sulcus between the cardinal angle knot and posterodorsal knot. This sulcus is prominent even on specimens without knots. The left valve knot-pattern is similar of that.

Dimensions: adult carapaces: L = 0.60 - 0.76 m, H = 0.34 - 0.41 mm, W = 0.29 - 0.31 mm, L/H = 1.63 - 1.97

Occurrence: Dorog Area: Ótokod pit samples A2, A3, A5, A9, A10; Tokod-527 borehole 213.8 - 227.9 m; Csolnok borehole 301.1 - 309.2 m; Csolnok 699/b borehole 530.6 - 532.0 m; Esztergom 81 borehole 264.2 - 266.7 m. Mány Area: Mesterberek 76 borehole 323.0 - 325.9 m; Mesterberek 81 borehole 140.0 m; Mesterberek 180 borehole 78.0 - 79.5 m; Mány 55 morehole 426.0 m; Csordakút 113 borehole 304.0 - 307.0 m; Csordakút 115 borehole 306.0 m.

Material: 83 carapaces 10 right valves, 11 left valves, 12 fragments.

Stratigraphical range in Hungary: Middle Eocene (Bartonian).

Schulerideinae MANDELSTAM, 1959 subfamilia
Schuleridea SWARTZ et SWAIN, 1946 genus

Schuleridea mirkmalovi SAKINA, 1971
Pl. 7, f. 1–6.

1971. *Schuleridea mirkmalovi* n. sp. - SAKINA, pp. 174-177., Pl. I., f. 1-1a.

Remarks: a very elongated form with spine-like strong tubercules in the cardinal angle of both walves. No distinct marginal spines. The pits are small and very dense.

Dimensions: adult carapaces: L = 0.83 - 0.88 mm, H = 0.50 - 0.56 mm, W = 0.38 - 0.42 mm, L/H = 1.52 - 1.67.

Occurrence: Bakony Area: Somlóvásárhely-1 borehole 664.4 - 684.0 m.

Material: 30 carapaces, 7 right valves, 8 left valves, 11 fragments.

Stratigraphical distribution without Hungary: Middle Eocene, Uzbekistan.

Stratigraphical range in Hungary: Middle Eocene (Bartonian).

Schuleridea (Aequacytheridea) perforata (ROEMER, 1838)
Pl. 7, f. 7–8, Pl. 8, f. 1–8, Pl. 9, f. 1.

1838. *Cytherina perforata* n. sp. - ROEMER, p. 516., Pl. VI., f. 11.
Cum. Syn. 1985a. *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838) - MONOSTORI, pp. 56-60., Pl. V., f. 17-22., Pl. VI., f. 1-14.
1973. *Schuleridea perforata* (ROEMER) - OLTEANU, POPESCU, Pl. III., f. 22-23.
1973. *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838) - SÖNMEZ-GÖKÇEN, p. 51., Pl. VI., f. 17-21.
1975. *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838) - WILLEMS, p. 517., Pl. 1., f. 10.
1977. *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838) - SZCZECHURA, pp. 77-78., Pl. 15., f. 8., Pl. 18., f. 1-7.
1978. *Schuleridea (Aequacytheridea) perforata perforata* (ROEMER, 1838) - KEEN, 1978., Pl. 6., f. 13.
1984. *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838) - GUERNET, p. 123., Pl. 1., f. 12., 14.
1985. *Schuleridea (Aequacytheridea) perforata* (ROEMER, 1838) - DUCASSE et al., Pl. 77., f. 1.
1985. *Schuleridea (Aequacytheridea)* cf. *perforata* (ROEMER, 1838) - DUCASSE et al., Pl. 77. F. 2-3.
1985. *Schuleridea perforata* (ROEMER) forme *"initiale"* - DUCASSE et al., p. 161., Pl. I., f. 1-3.
1987. *Schuleridea perforata* (RÖMER, 1838) - WANEK, MÉSZÁROS et al., Pl. 1., f. 3.
1987. *Schuleridea perforata* (RÖMER, 1836) - WANEK, GÁBOS et al., Pl. III., f. 1.
1988. *Schuleridea* cf. *perforata* (ROEMER, 1838) - BARBIN et GUERNET, p. 218., Pl. 2., f. 15-16.
1993. *Aequacytheridea perforata* (ROEMER) - RUSU et al., Pl. III., f. 1.

Remarks: contrasting with the work of FARKAS (1986) the species is very variable in the Hungarian Eocene. The L/H ratio, the angularity of the dorsal outline and the posterior end the convexity of the ventral outline of the left valve, the strength of the swelling at the cardinal angle and the lateral pits all are very variable even in the same sample. The type figure of ROEMER (1838) is near to the short forms of this material, but on figs OERTLI (1956) and KOLLMANN (1960) showing specimens from the type locality there are variously elongate forms. The wide and perhaps ecological variability cover up the sexual dimorphism also appearing in the L/H ratio. Some forms figured as *perforata* are probably different species, as in MOYES, 1965. In the Bartonian material of Hungary the most frequent are the more or less stubby and nearly triangular forms refering to left valves. In the Early Priabonian most of the specimens belong to the elongated forms with dense central

pitting on surfaces (like to the specimens of OERTLI, 1956 from the type locality).

Dimensions: adult carapaces: L = 0.66 - 0.83 mm, H = 0.44 - 0.55 mm, L/H = 1.44 - 1.60, W = 0.34 - 0.43 mm.

Occurrence: Budapest Area: Budakeszi 6 borehole 114.5 - 152.0 m. Cserhát Area: Kósd 20 borehole 123.9 - 137.3 m. Dorog Area: Tokod, Ebszõny outcrop; Ótokod, open pit mine, samples A1-A20, B1-B10; Bajót Búzáshegy-ravine, sample 7; Tokod 527 borehole 210.2 - 334.2 m; Csolnok borehole 296.4 - 391.6 m; Csolnok 699/b borehole 517.2 - 534.0 m; Esztergom 81 borehole 264.2 - 290.4 m; Nyergesújfalu 31 borehole 4.5 - 300.0m. Mány Area: Csabdi 74 borehole 240.0 - 303.9 m; Csordakút 113 borehole 295.0 - 370.0 m; Csordakút 115 borehole 249.0 - 414.0 m; Mány 55 borehole 430.0 - 511.0 m; Mesterberek 68 borehole 186.5 - 206.5 m; Mesterberek 75 borehole 278.0 - 376.0 m; Mesterberek 76 borehole 269.6 - 403.3 m; Mesterberek 78 borehole 351.0 - 396.0 m; Mesterberek 81 borehole 146.0 - 214.0 m; Mesterberek 88 borehole 284.4 - 300.0 m; Mesterberek 118 borehole 308.0 - 406.0 m; Mesterberek 180 borehole 79.5 - 137.3 m; Tabajd 6 borehole 76.8 - 148.0 m; Tabajd 7 borehole 168.8 - 174.8 m. Tatabánya Area: Oroszlány 2266 borehole 220.9 m; Oroszlány 2301 borehole 423.3 m; Oroszlány 2361 borehole 278.6 - 328.8 m; Oroszlány 2370 borehole 622.5 m; Tarján 8 borehole 230.5 - 256.3 m; Tarján 9 borehole 355.0 - 411.8 m; Tatabánya 1474 borehole 300.5 - 303.6 m; Tatabánya 1481 borehole 121.7 - 272.5 m; Vértessomló 22 borehole 91.8 - 94.6 m. Bakony Area: Csetény 61 borehole 472.5 m; Somlóvásárhely 1 borehole 551.0 m.

Material: 2689 carapaces, 393 left valves, 417 right valves, 258 fragments.

Stratigraphical distribution without Hungary: Europe: Eocene to Oligocene.

Stratigraphical range in Hungary: Middle to Upper Eocene.

Schulerideа aff. *perforata* (ROEMER, 1838)
Pl. 9, f. 2.

Remarks: an alongated form with dorsal outline more arched than angulated. The ventral outline of the left valve is slightly concave. The posterior outline of the left valves is rather broad and pointless. The pits are small and scattered. It looks possible to be a new subspecies or species, but there are specimens of typical *perforata* and transitional forms in the same samples.

Dimensions: adult carapaces: L = 0.72 - 0.84 mm, H = 0.44 - 0.50 mm, L/H = 1.59 - 1.76, W = 0.35 - 0.37 mm.

Occurrence: Mány Area: Csabdi 74 borehole 282.6 - 284.2 m; Csordakút 115 borehole 386.0 - 393.0 m; Mány 55 borehole 483.0 - 493.0 m; Mesterberek 75 borehole 370.0 m; Mesterberek 76 borehole 393.5 - 398.1 m; Mesterberek 78 borehole 387.0 m; Mesterberek 118 borehole 394.0 - 400.0 m.

Material: 1036 carapaces, 272 left valves, 283 right valves, 154 fragments.

Stratigraphical range in Hungary: Middle Eocene (Bartonian).

Cuneocytherinae MANDELSTAM, 1959 subfamilia
Monsmirabilia APOSTOLESCU, 1955

Monsmirabilia kosdensis n. sp.
Pl. 9, f. 3–5.

Derivatio nominis: after the type locality.

Holotypus: carapace.

Locus typicus: Kósd, N. Hungary

Stratum typicum: Kósd 20 borehole, 114.5 - 116.5 m, Priabonian.

Diagnosis: elongate form with nearly straight and parallel dorsal and ventral outlines.

Description: The anterior outline of the left valve is symmetrically rounded. The dorsal outline slightly arched to the 0.7-0.8 of the length, the posterior outline is asymmetrical, its upper part has a large radius, the lower part has a small radius. The ventral outline is nearly straight. The right valve is very similar in shape, the dorsal outline is nearly straight, there is a distinct sinus at the posterior part of the straight ventral outline.

Ornamentation: there is a sharp anteromarginal ridge on the right valve with deep circum marginal sulcus behind it. The posteroventral surface of the right valve is depressive. The surface of valves is covered by small pits beeing more dense posteriorly. The left valve overlap the right throughout, especially along the dorsal and ventral outlines.

Dimensions: adult carapaces: L = 0.48 - 0.65 mm, H = 0.26 - 0.35 mm, W = 0.20 - 0.23 mm, L/H = 1.69 - 1.92.

Comparison: similarly elongate forms are *M. perforata* (BOSQUET, 1850) and *M. subradiosa* (BOSQUET, 1850) [= *M. subovata* APOSTOLESCU nom. nov, 1955] in APOSTOLESCU, 1955 and the *M. oblonga* APOSTOLESCU, 1955 but the outlines differ in running.

Occurrence: Budapest Area: Budakeszi 6 borehole 114.4 - 129.4 m. Cserhát Area: Kósd 20 borehole 124.4 - 144.3 m.

Material: 72 carapaces, 2 right valves, 3 left valves.

Stratigraphical range in Hungary: Lower Priabonian.

Monsmirabilia triebeli KEIJ, 1957
Pl. 9, f. 6–8, Pl. 10, f. 1–8.

1957. *Cuneocythere (Monsmirabilia) triebeli* n. sp. - KEIJ, p. 79., Pl. IX., f. 1-4.

Cum. syn. 1985a. *Monsmirabilia triebeli* KEIJ, 1957 - MONOSTORI, pp. 60-64., Pl. VI., f. 15-27., Pl. VII., f. 1-8.

1969. *Monsmirabilia vulgaris* n. sp. - PIETRZENIUK, pp. 38-39., Pl. VI., f. 4-6., Pl. XIX., f. 6., Pl. XXIII., f. 20-21.

1985. *Monsmirabilia triebeli* KEIJ, 1957 - DUCASSE et al., Pl. 77., f. 10-11.

1987. *Monsmirabilia triebeli* KEIJ, 1957 - MONOSTORI, p. 144., Pl. 3., f. 10-11.

Remarks: at the Gánt material the anterior part of the dorsal outline is straight on the left valves and the anterior outline is less broadly rounded as compared to specimens of other localities of Hungary. At Sümeg, Darvastó and Somlóvásárhely 1 material the ventral outline of the left valve is less convex, the form is stubby, the roundness of the anterior and posterior outlines resemble each other very nearly as compared to specimens of other localities of Hungary. The pits on the lateral surface sometimes are larger on the most swelled part of valve, on another specimens are similare on the whole surface. For this reason I think *C. (M.) vulgaris* PIETRZENIUK, 1969 belonging to *M. triebeli* KEIJ, 1957.

Dimensions: adult carapaces: L = 0.42 - 0.65 mm, H = 0.26 - 0.36 mm, L/H = 1.41 - 1.64.

Occurrence: Dorog Area: Ótokod pit A1, A2, A4, A5, A8, A9, A10, A11, A13, A14, B6 samples; Bajót, Búzáshegy ravine sample 13; Lábatlan-Nyergesújfalu river wall sample 5; Tokod 527 borehole 198.4 - 282.2 m; Csolnok borehole 296.4 - 325.4 m; Csolnok 699/b borehole 520.0 - 601.4 m; Esztergom 81 borehole 225.6 - 290.4 m; Nyergesújfalu 31 borehole 189.0 - 286.8 m. Mány Area: Csabdi 74 borehole 281.8 - 264.6 m; Csordakút 113 borehole 292.0 - 322.0 m; Csordakút 115 borehole 249.0 - 427.0 m; Mány 55 borehole 424.0 - 509.0 m; Mesterberek 46 borehole 94.2 - 94.7 m; Mesterberek 68 borehole 182.0 - 186.5 m; Mesterberek 75 borehole 272.5 - 343.0 m; Mesterberek 76 borehole 288.2 - 370.8 m; Mesterberek 78 borehole 375.0 m; Mesterberek 81 borehole 129.0 - 190.0 m; Mesterberek 88 borehole 269.0 m; Mesterberek 118 borehole 287.1 - 370.6 m; Mesterberek 180 borehole 68.0 - 160.6 m. Mór-Tatabánya Area: Mór 16 borehole 82.6 - 84.6 m; Oroszlány 1838 borehole 305.0 - 306.9 m; Oroszlány 2200 borehole 585.8 m; Oroszlány 2260 borehole 223.0 m; Oroszlány 2274 borehole 525.2 - 534.2 m; Oroszlány 2341 borehole 407.7 - 408.3 m; Oroszlány 2370 borehole 627.5 m; Tatabánya 1481 borehole 133.9 - 151.7 m; Várgesztes 1 borehole 98.9 - 100.7 m. Bakony Area: Csabrendek 850 borehole 87.2 - 87.8 m; Somlóvásárhely 1 borehole 833.7 - 837.7 m; Sümeg, Darvastó bauxite pit.

Material: 2936 carapaces, 72 right valves, 148 left valves, 57 fragments.

Stratigraphical distribution without Hungary: France: Eocene, England: Ypresian to Bartonian, The Netherlands: Bartonian, Belgium: Ypresian to Bartonian, Germany: U.? Eocene.

Stratigraphical range in Hungry: Lutetian-Bartonian.

Monsmirabilia n. sp. 1
Pl. 11, f. 1.

Remarks: very stubby form, nearly oval, the roundness of the anterior and posterior outlines are similar, the posterior one somewhat more narrow and asymmetric. The anteromarginal ridge of the right valve is conspicuous, the overlap is moderate. The ornamentation is not observable because of the bed preservation.

Dimensions: adult carapaces: L = 0.56 - 0.71 mm, H = 0.37 - 0.47 mm, L/H = 1.49 - 1.53.

Occurrence: Bakony Area: Sümeg, Darvastó bauxite pit.

Material: 3 carapaces, 2 left valves.

Stratigraphical range in Hungary: Lutetian.

Krithidae MANDELSTAM, 1960 familia
Krithe BRADY, CROSSKEY et ROBERTSON, 1874 genus

Krithe angusta DELTEL, 1961
Pl. 11, f. 2–3.

1961. *Krithe angusta* n. sp. - DELTEL, pp. 108-109., Pl. 8., f. 111-114.
1962. *Krithe cancuenensis* VAN DEN BOLD/elongata VAN DEN BOLD - KOLLMANN, pp. 202-203. Pl. 5., f. 12-18.
1964. *Krithe angusta* n. sp. - DELTEL, p. 170., Pl. IV., f. 81-82.
1980. *Krithe cancuenensis ambigua* n. sp. - POKORNÝ, pp. 341-344., textfigs 8-13., Pl. II., f. 2-3., Pl. IV., f. 1-2.
1981. *Krithe cancauensis ambigua* POKORNÝ, 1980 - POKORNÝ, Pl. 1., f.4.
1985. *Krithe angusta* DELTEL, 1964 - DUCASSE et al., Pl. 78., f. 6-8.

Remarks: DELTEL's type material is conspecific with subsequent form of Pokorný.

Dimensions: adult carapace: L = 0.75-0.86 mm, H = 0.40-0.41 mm, L/H = 1.83-2.19.

Occurrence: Somlóvásárhely 1 borehole 585.5-640.1 m;? Cserépváralja 1 borehole 422.3-422.5 m

Material: 6 carapaces, 2 right valves, 1 fragment.

Stratigraphical distribution without Hungary: France: Eocene-Oligocene, Czech Republic: Lower Eocene, Lower Oligocene, Croatia: Lutetian.

Stratigraphical range in Hungary: Middle Eocene (Bartonian), ? Topmost Priabonian.

Krithe bartonensis (JONES, 1857) s.l.
Pl. 11, f. 4–8, Pl. 12, f. 1–8.

1857 *Cytherideis bartonensis* n. sp. - JONES, p. 50., Pl. V., f. 2a-b., 3a-b.
1894. *Krithe bartonensis* JONES - LIENENKLAUS, pp. 252-253., Pl. XVII., f. 9.
1936. *Krithe bartonensis* (JONES) - MÉHES, pp. 37-38., Pl. III., f. 26-30.
1957. *Krithe bartonensis* (JONES, 1857) KEIJ, p. 85., Pl. VIII., f. 11-17.
1957. *Krithe rutoti* n. sp. - KEIJ, p. 86., Pl. VIII., f. 5-10.
1959. *Krithe rutoti* KEIJ, 1957 - DUCASSE, pp. 50-51., Pl. XX., f. 4.
1959. *Krithe bartonensis* (Jones, 1857) - Ducasse, pp. 49-50., Pl. III., f. 1., Pl. XX., f. 3a-b.
1962. *Krithe sonnbergensis* n. sp. - HINTE, pp. 173., Pl. II., f. 6-8.
1969. *Krithe bartonensis* (JONES, 1857) - PIETRZENIUK, p. 21., text-figs 5-6., Pl. V., f. 12., Pl. XV., f. 4-6.
1969. *Krithe bartonensis* (JONES, 1857) - SCHEREMETA, pp. 88-89., Pl. VII., f. 1-2.
1959. *Krithe rutoti* KEIJ, 1957 - SCHEREMETA, p. 91., Pl. VII., f. 3-4.

1969. *Krithe rutoti* KEIJ, 1957 - DUCASSE, p. 56., Pl. III., f. 71.
1970. *Krithe bartonensis* (JONES, 1857) - HASKINS, pp. 13-16., Pl. 1., f. 5-14.
1970. *Krithe rutoti* KEIJ, 1957 - HASKINS, p. 16., Pl. 1., f. 1-4.
1971. *Krithe bartonensis* (Jones, 1856) - BLONDEAU, pp. 82-83., Pl. IX., f. 6.
1971. *Krithe rutoti* KEIJ, 1957 - BLONDEAU, pp. 83-84., Pl. IX., f. 8.
1973. *Krithe bartonensis* (Jones, 1856) - SÖNMEZ-GÖKÇEN, p. 54., Pl. VII., f. 3-7.
1973. *Krithe rutoti* KEIJ, 1957 - SÖNMEZ-GÖKÇEN, pp. 55-56., Pl. VII., f. 11-13.
1975. *Krithe rutoti* KEIJ, 1957 - CARBONNEL, p. 58., Pl. 1., f. 6-8.
1975. *Krithe rutoti* KEIJ, 1957 - WILLEMS, p. 515., Pl. 1., f. 8.
1977. *Krithe bartonensis* (JONES, 1857) - MONOSTORI, pp. 89-91., Pl. II., f. 9., 11., 13-14.
1978. *Krithe bartonensis* (JONES, 1857) - KEEN, p. 408., Pl. 5., f. 12.
1978. *Krithe rutoti* KEIJ, 1957 - KEEN, 1978., p. 408., Pl. 5., f. 11.
1980. *Dentokrithe bartonensis* (JONES) - KHOSLA et HASKINS, p. 214., Pl. 1., f. 7-13.
1985a. *Krithe bartonensis* (JONES, 1857) - MONOSTORI, pp. 64-66., Pl. VII., f. 9-21.
1987. *Krithe bartonensis* (JONES, 1857) - MONOSTORI, p. 145., Pl. 3., f. 12-13.
1987. *Krithe bartonensis* (JONES, 1850) - WANEK et al., Pl. II., f. 3.
1989. *Krithe rutoti* KEIJ 1957 (with all his "morphas") - DUCASSE et ROUSSELLE, pp. 5-14., Pl. 1., f. 1-18.

Remarks: The hinge "denticle" which is the *Dentokrithe* based on has different degree in this large material. Therefore I did not use the genus *Dentokrithe*. There are some problems in the interpretation of species. Our material shows a considerable shape-variability without a distinct temporal tendency. KEEN (1978) already was sceptical about the discrimination of *bartonensis* form *rutoti*. The *sonnbergensis* was based on similar differences. All these materials I think better to leave in the sensu lato *bartonensis*. The specimens from Budakeszi are somewhat more arched dorsally as compared to specimens of other localities.

Dimensions: adult carapaces: L = 0.51-0.86 mm, H = 0.22-0.44 mm, L/H = 1.89-2.27. In the Mány Coal Basin: L = mainly 0.62-0.72 mm, in the Tatabánya Coal Basin mainly 0.72-0.82, the form from Budakeszi mainly 0.80-0.85 mm.

Occurrence: Budapest area: Budakeszi 6 borehole 108.3-152.2 m; Cserhát area: Kósd 20 borehole 110.2-140.5m; Dorog Area: Ótokod-pit, samples A1-A10, B6-B10; Bajót-Búzáshegy ravine beds 3-5; Tokod 527 borehole 207.5-339.5 m; Csolnok borehole 296.4-329.4 m; Csolnok 699/b borehole 520.0-532.0 m; Esztergom 81 borehole 248.5-287.1 m; Nyergesújfalu 31 borehole 27.3-271.1 m. Tokod, Ebszõny outcrop. Mány Area: Csabdi 74 borehole 262.5-297.3 m; Csordakút 113 borehole 292.0-370.0 m; Csordakút 115 borehole 249.0-487.0 m; Mány 55 borehole 430.0-516.0 m; Mesterberek 46 borehole 94.0-94.7 m; Mesterberek 68 borehole 186.5-206.0 m; Mesterberek 75 borehole 272.5-368.0 m; Mesterberek 76 borehole 295.9-421.0 m; Mesterberek 78 borehole 375.0-385.0 m; Mesterberek 81 borehole 138.0-214.0 m; Mesterberek 88 borehole 269.0-289.5 m; Mesterberek 118 borehole 287.1-396.0 m; Mesterberek 180 borehole 68.0-127.6 m; Tabajd 6 borehole 76.8-148.0 m; Tabajd 7 borehole 144.8-150.8 m. Mór-Tatabánya Area: Mór 16 borehole 84.6-92.2 m; Oroszlány 2266 borehole 204.0-220.9 m; Oroszlány 2274 borehole 477.0-530.5 m; Oroszlány 2291 borehole 443.0 m; Oroszlány 2301 borehole 422.0 m; Oroszlány 2361 borehole 278.6-422.0 m; Tarján 8 borehole 230.5-260.5 m; Tarján 9 borehole 364.0-418.9 m; Tatabánya 1481 borehole 111.3-

279.0 m; Várgesztes 1 borehole 95.5-100.7 m; VS-22 borehole 91.8-118.6 m; Gánt, bauxite pit. Bakony Area: Csabrendek 850 borehole 69.8-87.8 m; Dudar Coal Mine.

Material: 11382 carapaces, 123 left valves, 166 right valves, 229 fragments.

Stratigraphical distribution without Hungary: England: Lower to Middle Eocene; The Netherlands and Belgium: Lower to Middle Eocene; France: ? Paleocene - ? Oligocene; Germany: Middle Eocene - ? Lower Oligocene; Ukraina: Lower Eocene - Upper Eocene; Romania: Upper Eocene; Turkey: Middle Eocene - ? Lower Oligocene. Stratigraphical range in Hungary: Middle Eocene (Bartonian) - Early Priabonian.

Krithe aff. *curvidorsalis* MANDELSTAM in ROSYEVA, 1962
Pl. 13, f. 1–2.

aff. 1962. *Krithe curvidorsalis* MANDELSTAM n. sp. - ROSYEVA, p. 27., Pl. IV., f. 1-3.

Remarks: Characteristical is the asymmetrically and broadly rounded dorsal outline with shallow depression between the anterior and dorsal outlines on the right valve, the fairly concave ventral outline. From the original description impossible to verify the presence or abscence the posterior incision in dorsal view of carapace.

Dimensions: carapaces: L = 0.62 - 0.84 mm, H = 0.34 - 0.44 mm, L/H = 1.73 - 1.91.

Occurrence: Budapest Area: Budapest, Vár-Hill; Budapest, SzOT 1 borehole 7.0 m; Budapest, Kiscell 1 borehole 100.2 m; Bakony Area: Bakonycsernye 18 380 ,0 m; Csetény 61 borehole 290.0 m, 350.0 m; Somlóvásárhely 1 borehole 600.0 m.

Material: 10 carapace, 2 right valve.

Stratigraphical range in Hungary: Middle Eocene (Bartonian) Priabonian.

Krithe kollmanni POKORNÝ, 1980
Pl. 13, f. 3–5.

1962. *Krithe crassicaudata* VAN DEN BOLD - KOLLMANN, pp. 201-202., Pl. 5., f. 1-11.
1980. *Krithe kollmanni* n. sp. - POKORNÝ, pp. 338-341., textfigs 1-7., Pl. I., f. 1-3., Pl. II., f. 1., Pl. III., f. 1-3.

Remarks: The outlines fit in this species, the inner characters are not visible. The species is very close to the *Kr. luyensis* DELTEL, 1961, but the valves are far more inflated in dorsal view.

Dimensions: carapace: L = 0.71 mm, H = 0.46 mm, W = 0.35 mm, L/H = 1.53.

Occurrence: Bakony Area: Somlóvásárhely 1 borehole 584.0-599..2 m.

Material: 10 carapaces, 4 left valves, 10 right valves, 1 fragment.

Stratigraphical distribution without Hungary: Czeh Republic: Lower Eocene and Lower Oligocene; Croatia: Lutetian.

Stratigraphical range in Hungary: Middle Eocene (Bartonian)

Krithe parapernoides n. sp.
Pl. 13, f. 6–8, Pl. 14, f. 1–4.

1985a. *Krithe* n. sp. aff. *Kr. pernoides* BORNEMANN, 1855 - Monostori, pp. 66-67., Pl. VII., f. 22-27.

Derivatio nominis: after its similarity to *Kr. pernoides.*

Holotypus: carapace.

Locus typicus: Tokod in Dorog Coal basin.

Stratum typicum: Tokod 527 borehole, 306.1-308.5 m, Middle Eocene, Bartonian.

Diagnosis: The outlines are similar to *Kr. pernoides* BORNEMANN, 1855 but this form has no posterior excision in dorsal view.

Description: The description of the outlines is in MONOSTORI, 1985a. On a part of specimens the dorsal outline is slightly arched. The inner features are not visible on the material.

Dimensions: adult carapaces: L = 0.83-1.04 mm, H = 0.43-0.48 mm, L/H = 2.24-1.90.

Comparison: The lack of the posterior excision is a characteristical difference from the *pernoides,* the outlines is similar to the elongated form of *pernoides* including its type. The dimensions are far larger as compared to *pernoides.*

Occurrence: Dorog Area: Tokod 527 borehole 296.4-308.5 m; Csolnok borehole 376.8-391.2 m; Csolnok 699/b borehole 575.0-587.5 m. Tatabánya Area: Oroszlány 1838 borehole 279.0-297.0 m; Oroszlány 2200 borehole 576.4-579.5 m; Oroszlány 2210 borehole 540.8-551.7 m; Oroszlány 2266 borehole 212.3-215.2 m; Oroszlány 2274 borehole 483.5 ?, 513.0-523.0 m; Oroszlány 2291 borehole 460.7-471.4 m; Oroszlány 2301 borehole 415.0-421.0 m; Oroszlány 2361 borehole 336.8 m; Oroszlány 2370 borehole 563.6-618.6 m; Tatabánya 1474 borehole 290.6-300.5 m; Tatabánya 1481 borehole 243.9-265.9 m. Bakony Area: Bakonycsernye 18 borehole 355.0-360.0 m; Balinka 333 borehole 525.0-545.0 m; Csetény 61 borehole 455.0-465.0 m.

Material: 261 carapaces, 82 right valves, 34 left valves, 257 fragments.

Stratigraphical range in Hungary: Middle Eocene.

Krithe pernoides (BORNEMANN, 1855) s.l.
Pl. 14, f. 5–8, Pl. 15, f. 1–3.

1855 *Bairdia pernoides* n. sp. - BORNEMANN p. 358, Pl. XX., f. 7-8.
1958. *Krithe caucasica* n. sp. - MANDELSTAM, p. 280., Pl. VI., f. 3.
1961. *Krithe* cf. *caudata* VAN DEN BOLD - DELTEL, p. 110., Pl. 8. f. 117.

1961. *Krithe parvula* n. sp. - DELTEL, pp. 113-114., Pl. 8. f. 125-129.
1963. *Krithe singularis* n. sp. - LI, 1963, p. 60., Pl. I., f. 5.
1964. *Krithe parvula* DELTEL, 1961 - DELTEL, pp. 171-173., Pl. IV., f. 86-89.
1973. *Krithe truncata* n. sp. - SÖNMEZ-GÖKÇEN, p. 56., Pl. VII., f. 14-16.
1981. *Krithe retraflexa* n. sp. - NIKOLAEVA, pp. 9-10., Pl. II. f. 5-7.
1982. *Krithe pernoides* (BORNEMANN, 1855) - MONOSTORI, pp. 55-56., Pl. V., f. 4-10., (cum syn.)
1985b. *Krithe pernoides* (BORNEMANN, 1855) - MONOSTORI, pp. 189-190., Pl. 4., f. 9.
1985. *Krithe parvula* DELTEL, 1961 - DUCASSE et al., Pl. 78., f. 14.
1985. *Krithe* cf. *caudata* VAN DEN BOLD, 1946 - DUCASSE et al., Pl. 78., f. 9-10.

Remarks: There are equally elongated, short and intermediate forms in the Eocene with intermediate forms. The dorsal and ventral outlines are nearly parallel and straight or slightly arched. The anterior outline is symmetrically rounded. The posterior carapace incision distinct.

Dimensions: adult carapaces: L = 048-0.84 mm, H = 0.24-0.38 mm, L/H = 1.71-2.43, W = 0.20-0.34 mm.

Occurrence: Budapest Area: Budapest, Kelenhegyi street; Kiscell 1 borehole 100.2-103.5 m; Budapest, Pusztaszeri street, samples 1, 2, 13, 20, 21, 22, 24, 27; Budapest, Vár-Hill; SzOT 1 borehole 46.0-54.0 m. Bükk Area: Cserépváralja 1 borehole 407.4-435.8 m. Mór-Tatabánya Area: Mór 16 borehole 28.7-75.5 m; Oroszlány 1838 borehole 254.3-293.3 m; Oroszlány 1884 borehole 150.0-153.6 m; Oroszlány 2291 borehole 448.0 m; Oroszlány 2370 borehole 593.0-609.0 m. Bakony Area: Bakonycsernye 18 borehole 293.0-370.0 m; Balinka 333 borehole 535.0-565.0 m; Csetény 61 borehole 455.0-462.5 m; Padragkút outcrop, sample 13.; Somlóvásárhely 1 borehole 546.7-703.7 m.

Material: 238 carapaces, 31 left valves, 32 right valves, 33 fragments.

Stratigraphical distribution without Hungary: Germany: Upper Eocene - Upper Oligocene; Belgium, Netherlands: Rupelian; Italy: Miocene; Ukraina: Oligocene.

Stratigraphical range in Hungary: Middle Eocene - Upper Oligocene.

Krithe sp.

Remarks: 110 poorly preserved specimens from the Lutetian-Priabonian of the Bakony Area, Mór-Tatabánya Area and Budapest Area.

Turmaekrithe PIETRZENIUK, 1969 genus

Turmaekrithe fragilis PIETRZENIUK, 1969
Pl. 15, f. 4–6.

1969. *Turmaekrithe fragilis* n. sp. - PIETRZENIUK, p. 24., Pl. II., f. 11-13., Pl. XV., f. 10-12.
1977. *Turmaekrithe fragilis* PIETRZENIUK, 1969 - SZCZECHURA, 79., Pl. 15., f. 6., Pl. 17., f.7.
1985b.? *Turmaekrithe fragilis* PIETRZENIUK, 1969 - MONOSTORI, p. 191.
1993. *Turmaekrithe fragilis* PIETRZENIUK - RUSU et al., Pl. III., f. 16.

Remarks: the shape and especially the broadly rounded posterior outline is typical for this species. Specimens age of Middle Eocene are more elongate and more similar to PIETRZENIUK's type material.

Dimensions: adult carapaces: L = 0.42 - 0.51 mm, H = 0.16 - 0.23 mm, L/H = 2.23 - 2.65.

Occurrence: Bükk Area: Cserépváralja 1 borehole 435.6 - 435.8 m. Dorog Area: Tokod 527 borehole 310.6 - 316.3 m. Mány Area: Csordakút 115 borehole 304.0 m. Tatabánya Area: Oroszlány 1838 borehole 279.0 - 283.0 m; Tatabánya 1481 borehole 247.9 - 249.9 m. Bakony Area: Balinka 333 borehole 540 - 555.0 m.

Material: 9 carapaces

Stratigraphical distribution without Hungary: Germany: Upper? Eocene, Poland: Upper Eocene.

Stratigraphical range in Hungary: ? Lutetian, Bartonian and topmost Priabonian.

Cushmanideidae Puri, 1973 familia
Parakrithe VAN DEN BOLD. 1958 genus

Parakrithe aff. *costatomarginata* MONOSTORI, 1982
Pl. 15, f. 7.

aff. 1982. *Parakrithe costatomarginata* n. sp. - MONOSTORI, pp. 54-55., Pl. V., f. 3.

Remarks: the shape is less elongate, the anterior and posteroventral costa-like elevation is weak but observable.

Dimensions: adult carapaces: L = 0.48 -0.50 mm, H = 0.23 - 0.24 mm, L/H = 2.11 - 2.13.

Occurrence: Budapest Area: Budapest, Pusztaszeri street, outcrop, samples N° 3., 5., 10., 13., 21., 27.

Material: 10 carapaces.

Stratigraphical range in Hungary: Upper Priabonian.

Trachyleberididae SYLVESTER-BRADLEY, 1948 familia
Trachyleberidinae SYLVESTER-BRADLEY, 1948 subfamilia
Trachyleberidini SYLVESTER-BRADLEY, 1948 tribus
Trachyleberis BRADY, 1898 genus

Trachyleberis spinosa LIENENKLAUS, 1900
Pl. 15, f. 8, Pl. 16, f. 1–4.

1900. *Cythereis spinosa* n. sp. - LIENENKLAUS, p. 516., Pl. XX., f. 4.
1957 *Trachyleberis (Trachyleberis) spinosa* (LIENENKLAUS, 1900) - KEIJ, p. 93., Pl. XII., f. 3., Pl. XIII., f. 5.
? 1962. *Trachyleberis aculeata* n. sp. - ROZYJEVA, p. 65., Pl. XVII., f. 6-7.

1969. *Trachyleberis (Trachyleberis) spinosa* (LIENENKLAUS, 1900) - PIETRZENIUK, p. 49., Pl. X., f. 1., Pl. XIX., f. 16., Pl. XXIV., f. 13-14.
1969. *Trachyleberis (Trachyleberis) spinosa* (LIENENKLAUS, 1900) - Scheremeta, pp. 179-180., Pl. XVII., f. 14-15.
1982. *Trachyleberis* cf. *spinosa* (LIENENKLAUS, 1900) - MONOSTORI, p. 56.
1985. *Trachyleberis* cf. *spinosa* (LIENENKLAUS, 1900) - MONOSTORI, pp. 71-72., Pl. VIII., f. 5.
1989. *Trachyleberis spinosa* (LIENENKLAUS, 1900) - GRÜNDEL, Abb. 14.

Remarks: on the hungarian specimens the spines are more uniform and only near the margins are some longer ones observable. The *aculeata* of ROZYJEVA (1962) perhaps belong to this species.

Dimensions: adult carapaces: L = 0.70 - 0.83 mm, H = 0.35 - 0.46 mm, L/H = 1.75 - 2.00 mm.

Occurrence: Dorog Area: Nyergesújtalu 31 borehole 297.4 - 300.0 m. Mór-Tatabánya Area: Oroszlány 1838 borehole 279.0 - 283.0 m; Oroszlány 1884 borehole 150.0 - 158.2 m; Oroszlány 2210 borehole 540.8 - 549.7 m; Oroszlány 2266 borehole 201.0 - 212.3 m; Oroszlány 2274 borehole 482.7 - 515.0 m; Oroszlány 2291 borehole 442.0 - 456.5 m; Oroszlány 2301 borehole 415.0 - 417.0 m; Oroszlány 2361 borehole 311.2 - 334.8 m; Oroszlány 2370 borehole 591.0 - 615.7 m; Tarján 8 borehole 242.7 - 244.7 m; Tatabánya 1481 borehole 228.4 - 251.9 m; Mór 16 borehole 41.4 - 71.6 m. Bakony Area: Balinka 333 borehole 545.0 - 565.0 m; Bakonycsernye 18 borehole 365.0 - 370.0 m; Csetény 61 borehole 455.0 m; Bakonyszentkirály 4 borehole 374.0 - 390.0 m.

Material: 89 carapaces, 12 right valves, 13 left valves, 29 fragments.

Stratigraphical distribution without Hungary: Germany: Middle Eocene - Lower Oligocene, Belgium: Lower Oligocene, Ukraina: Upper Eocene, Turkmenistan: Middle Eocene.

Stratigraphical range in Hungary: Lutetian?, Bartonian - Rupelian.

Costaini HARTMANN et PURI, 1974 tribus *Trachyleberidea* BOWEN, 1953

Trachyleberidea prestwichiana (JONES et SHERBORN, 1887) s.l.
Pl. 16, f. 5–7.

1887. *Cythereis prestwichiana* n. sp. - JONES et SHERBORN, p. 454., Pl. XI., f. 11a,b.
1889. *Cythereis prestwichiana* JONES et SHERBORN, 1887 - JONES et SHERBORN, p. 33., Pl. II., f. 13., 14a,b.
1900. *Cythereis postero-acuta* n. sp. - LIENENKLAUS, p. 521., Pl. XX., f. 7.
Non 1953. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - BOWEN, p. , f.A.6.
1957. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - KEIJ, p. 103., Pl. XVII., f. 19.
1961. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - DELTEL, p. 182., Pl. 18., f. 299-300.
1965. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - MOYES, pp. 97-98, Pl. XI., f.5.
1966. *Trachyleberidea posteroacuta* (LIENENKLAUS, 1900 - MOOS, p. 284.
1966. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - MOOS, p. 283-284., Pl. 25., f. 11.

Non. 1969. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - SCHEREMETA, pp. 215-216., Pl. XX., f. 11.
1969. *Trachyleberidea posteroacuta* (LIENENKLAUS, 1900) - PIETRZENIUK, p. 52., PL. X., f. 7.-, Pl. XX., f.5., Pl. XXV., f. 10-11.
1969. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - DUCASSE, p. 145., Pl. X., f. 205.
1970. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - GÖKÇEN, p. 82., Pl. III., f. 18-19.
1973. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - SÖNMEZ-GÖKÇEN, p. 92., Pl. XII., f. 14-15.
1977. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - WILLEMS, p. 517., Pl. 1., f. 11.
1978. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - KEEN, Pl. 11., f. 7.
1985. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - DUCASSE et al., Pl. 79., f. 7.
1985b. *Trachyleberidea* cf. *posteroacuta* (LIENENKLAUS, 1900) - MONOSTORI, p. 194.
1989. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) - GRAMANN, Pl. 2., f. 8.

Remarks: there is no continuous median ridge on the investigated forms only a subcentral and a posterior (at about 0.7 length) knot. The pointing of the posterior end and the strength of the anterior and posterior denticles are variable in the same Bartonian material. Also the "inclination" of the dorsal outline is variable and is not such a species character as was written by MOOS (1966). Unfortunately the detailes of the reticulation are not visible on the hungarian material. It will be necessary a comparative description of the *prestwichiana* and *posteroacuta* from the type localities based on scanning photos. According to literature the *prestwichiana* and *posteroacuta* are rather variations of a large and variable species then two distinct species.

Dimensions: adult carapaces: L = 0.78 - 0.98 mm, H = 0.39 - 0.47 mm, L/H = 1.82 - 2.18.

Occurrence: Bükk Area: Cserépváralja 1 borehole 407.4 - 419.2 m; Padragkút-Ravine, Somlóvásárhely 1 borehole 586.5 - 648.1 m.

Material: 19 carapaces, 6 right valves, 5 left valves, 6 fragments.

Stratigraphical distribution without Hungary: England: Lower Eocene, Germany: Upper Eocene - Lower Oligocene, France: Eocene - Oligocene, Belgium: Lower Eocene, Turkey: Middle to Upper Eocene.

Stratigraphical range in Hungary: Bartonian to Priabonian.

Phalcocythere SIDDIQUI, 1971 genus

Phalcocythere horrescens (BOSQUET, 1852)
Pl. 16, f. 8, Pl. 17, f. 1.

1852. *Cythere horrescens* n. sp. - BOSQUET, p. 119., Pl. VI., f. 5.
Cum syn. 1987. *Phalcocythere horrescens* (BOSQUET, 1852) - MONOSTORI, pp. 145-147., Pl. 3., f. 14-16.

Dimensions: adult left valves: L = 0.54 - 0.58 mm, H = 0.28 - 0.38 mm, L/H = 1.47 - 1.92.

Occurrence: Bakony Area: Dudar, coal mine.

Material: 19 valves, 7 fragments.

Stratigraphical distribution without Hungary: France: Ypresian - Ledian, Belgium: Lutetian - Dedian, Ukraina: Lutetian - Bartonian, Turkey: Bartonian.

Stratigraphical range in Hungary: ?Lutetian - Bartonian.

Phalcocythere budakesziensis n. sp.
Pl. 17, f. 2–4.

Derivatio nominis: after its locality name.

Holotypus: carapace.

Locus typicus: Budakeszi.

Stratum typicum: Priabonian, Bu-6 borehole 150.2 - 152.2 m.

Diagnosis: the species has weak and blunt spines, the dorsal and ventral part of the posterior outline similar in size.

Description: The anterior outline is asymmetrically rounded, the anterodorsal angle is ponted between 0.2 - 0.3 of length. The dorsal outline is straight apart from the pointing of the anterodorsal angle and the blunt spine-like dorsal ridge at ~ 0.8 length. The posterior outline has two branch, the dorsal is slightly concav, the ventral is hardly convex conecting at 130-150° angles to each other. After a breaking the ventral outline nearly straight with a sinus at ~ 0.3 of length.

The eye spot is accompanied by wide protuberation in the cardinal angle. The ventral ridge is gently arched from 0.2 - 0.7 or 0.8 of the length, rather week and there are some blunt spine on it. The dorsal ridge is a large and blunt spine with short dorsoventral and anterior prolongation. There is a distinct row of large spines near the anterior margin and another row of small spines on the margin. The inflated lateral surfaces are covered by blunt spines. The subcentral spines are not stronger as the adjoining ones.

Dimensions: adult carapaces: L = 0.66 - 0.71 mm, H = 0.35 - 0.45 mm, W = 0.32 mm, L/H = 1.53 - 1.83.

Comparison: the posterior outline is more symmetric as at *horrescens* et sumegensis. The ornamentation is less developed, there are n strongly developed subcentral spines characteristic for *horrescens* or strongly developed postero-lateral spines characteristic for *sumegensis.*

Occurrence: Budapest Area: Budakeszi 6 borehole 130.2 - 152.2 m.

Material: 5 carapaces.

Stratigraphical range in Hungary: Lower Priabonian.

Phalcocythere sumegensis n. sp.
Pl. 17, fig. 5.

Derivatio nominis: after its locality.

Holotypus: carapace

Locus typicus: Sümeg, Darvastó bauxit pit.

Stratum typicum: Lutetian, Darvastó Formation.

Diagnosis: The form has a few large spine on the posterior half of valve.

Description: the shape is similar to that ot the *Ph. horrescens.* The ornamentation consists of knots and spines. They are very strong at the antero- and posterodorsal corner and on the posterior half of the lateral surface (6-7 distant large spine). There is a straight and keel like ventral ridge from 0.15 to 0.8 length, and a row of little knots along the anterior margin. The dorsal keel is a short ridge broken in right angle at the posterodorsal corner.

Dimensions: adult carapace: L = 0.57 mm, H = 0.34 mm, L/H 7 1.68.

Comparison: All the ornamental elements are less developed as on Ph. horrescens, except of the 6-7 strong lateral spines on the posterior half of valves, which are not discernible on *Ph. horrescens.*

Occurrence: Bakony Area: Sümeg, Darvastó bauxite pit, Darvastó Formation.

Material: 3 carapaces.

Stratigraphical range in Hungary: Lower Lutetian.

Costa NEVIANI, 1928 genus

Costa cf. *hermi* WITT, 1967

Pl. 17, f. 6.

1985b. *Costa* sp. - MONOSTORI, p. 192.

Remarks: The dorsal ridge is shorter and more straight, the median and ventral ridges are longer and more continuous as those of the type. The ventral outline of the right valve is somewhat concave.

Occurrence: Budapest Area: Budapest, Pusztaszeri Street: sample No. 21.

Material: 1 carapace.

Stratigraphical range in Hungary: Uppermost Priabonian.

Costa sp. 1.

1985a. *Costa* sp. - MONOSTORI, p. 72.

Dimensions: adult carapaces L = 0.87 - 0.90 mm, H = 0.40 - 0.42 mm, L/H = 2.17 - 2.11.

Occurrence: Dorog Area: Nyergesújfalu outcrop, samples II/3., III/1.

Material: 2 carapace.

Stratigraphical range in Hungary: Priabonian?

Costa ? sp.

Remarks: a single fragmental exemplar with three longitudinal ridges.
Occurrence: Mány Area: Mesterberek 180 bofehole 126.3 - 127.6 m.
Stratigraphical range in Hungary: Bartonian.

Agrenocythere BENSON, 1972 genus

Agrenocythere ordinata (DELTEL, 1961)
Pl. 17, f. 7–8, Pl. 18, f. 1–3.

1961. *Bradleya ordinata* n. sp. - DELTEL, pp. 159-161., Pl. 15., f. 262-264.
1964. *Bradleya ordinata* n. sp. - DELTEL, pp. 187-189., Pl. V., f. 126-127.
1977. *Agrenocythere bensoni* n. sp. - POKORNÝ, pp. 384-390, text-fig. 1-5., Pl. I., f. 1-3.
1982. *Agrenocythere aculeataformis* n. sp - MONOSTORI, pp. 58-60., Pl. VI., f. 2.
1985b. *Agrenocythere bensoni* POKORNÝ, 1977 - MONOSTORI, pp. 191-192., Pl. 5., f. 1-2.
1985. *Agrenocythere ordinata* (DELTEL, 1964) - DUCASSE et al., p. 286., Pl. 79., f. 3-5.

Remarks: POKORNÝ's new species is obviously conspecific with ordinata of Deltel. The dorsal bullar series is more strong at the Bartonian specimens. The cardinal angle is more protruding and the costula in it become more thick upwards.

Dimensions: juvenile right valve: L = 0.89 mm, H = 0.48 mm, L/H = 1.83. Juvenile left valve: L = 0.68 - 0.74 mm, H = 0.40 - 0.41 mm, L/H = 1.71 - 1.80. Adult carapace: L = 1.06 - 1.12 mm, H = 0.54 mm, W = 0.53 - 0.60 mm, L/H = 1.96 - 2.7, L/W = 1.87 - 2.00.

Occurrence: Bükk Area: Cserépváralja 1 borehole: 407.4 - 407.6 mm, 412.4 - 412.5 m. Budapest Area: Budapest, Pusztaszeri Street, samples no. 17, 24, 27; Budapest, Ibolya utca, quarry: 7.9 m; Budapest, SZOT 6 borehole 10.8 m; Budapest, H 7 borehole 22 m. Bakony Area: Padragkút, outcrop, sample No. 13; Balinka 333 borehole 555.0 - 560.0 m; Csetény 61 borehole 286.0 m; Somlóvásárhely 1 borehole 585.5, 587.3, 588.3, 591.9, 592.4, 593.4, 594.2, 598.5, 599.2, 600.0, 602.8, 603.8, 606.8, 607.8, 610.0, 6130, 614.0, 620.7, 621.4, 623.2, 640.1, 644.8.

Material: 13 juvenile right valves, 14 juvenile left valves, 11 carapaces, 6 right valves, 5 left valves, 73 adult fragments, 2 juvenile fragments.

Stratigraphical and geographical distribution without Hungary: France: Eocene-Oligocene, Czechoslovakia: Lower - Middle Eocene, Lower Oligocene?.

Stratigraphical range in Hungary: Bartonian - Kiscellian.

Hazelina MOOS, 1966 genus

Hazelina indigena MOOS, 1966
Pl. 18, f. 4.

1966. Hazelina indigena n. sp. MOOS, pp. 286-288., Pl. 24., f. 1-12.
Cum syn. 1985b. Hazelina indigena MOOS, 1966 - MONOSTORI, pp. 193-194., Pl. 5., f. 3.
1993. Hazelina indigena Moos - RUSU et al., Pl. III., f. 8.

Remarks: on the scanning photo fine micro-reticulation is visible in the pits of the primer reticulation.

Dimensions: adult valves: L = 0.67 - 0.78 mm, H = 0.37 - 0.40 mm, L/H = 1.84 - 2.07.

Occurrence: Bükk Area: Cserépváralja 1 borehole 416.9 - 417.1 m; Noszvaj, Síkfőkút quarry, sample 15. Budapest Area: Budapest, Ibolya utca quarry 2.5 m (resedimented).

Material: 1 left valve, 3 right valve.

Stratigraphical distribution without Hungary: Germany: Upper? Eocene, Poland: Upper Eocene, England: Bartonian.

Stratigraphical range in Hungary: topmost Eocene.

Horrificiella LIEBAU, 1975

Horrificiella aculeata aculeata (BOSQUET, 1852)
Pl. 18, f. 5–8.

1852. *Cythere aculeana* n. sp. - MOSQUET, pp. 107-108., Pl. V., f. 10.
1955. *Trachyleberis aculeata* (BOSQUET) - APOSTOLESCU, pp. 271-272., Pl. VIII., figs 123-124.
1957. *Trachyleberis (Trachyleberis) aculeata* (BOSQUET) - KEIJ, p. 90., Pl. XIII., figs 16-17., Pl. XIV., figs 14-15.
1958. *Trachyleberis aculeata* BOSQUET - MARLIERE, p. 42., Pl. VI., f. 5.
1959. *Trachyleberis (Trachyleberis) aculeata* (BOSQUET) - DUCASSE, pp. 68-69., Pl. V., f.4., Pl. XXVI., fig 1a-b.
1961. *Trachyleberis aculeata* (BOSQUET) - DELTEL, pp. 183-184., Pl. 18., figs 301-302.
1965. *Trachyleberis (Trachyleberis) aculeata* (BOSQUET) - EAGAR, p. 24.
1969. *Trachyleberis aculeata* (BOSQUET) - PIETRZENIUK, p 50., Pl. X., f.2., Pl. XXIV., f. 12.
1969. *Trachyleberis (Trachyleberis) aculeata* (BOSQUET) - SCHEREMETA, pp. 175-176., Pl. XVII., figs 8-9.
1969. *Trachyleberis aculeata* (BOSQUET) - DUCASSE, pp. 147-148., Pl. X., f. 207.
1971. *Trachyleberis aculeata* (BOSQUET) - BLONDEAU, pp. 53-54., Pl. VI., f.6.
1971. *Trachyleberis (Trachyleberis) aculeata* (BOSQUET) - HASKINS, p. 147., Pl. 2., f. 1-10.
1973. *Trachyleberis aculeata* (BOSQUET) - MOOS, p. 37., Pl. 4., f. 3.
1973. *Trachyleberis aculeata* (BOSQUET, 1852) - SÖNMEZ-GÖKÇEN, p. 79., Pl. IX., f. 39-40.
1975. *Trachyleberis aculeata* (BOSQUET, 1852) - WILLEMS, p. 517., Pl. 1.F.12.
1975. *Oertliella aculeata* (BOSQUET) var. 3 TAMBAREAU, 1972 - CARBONNEL, pp. 48-49., Pl.2., f.8-10.
1977. *Oertliella aculeata* (BOSQUET, 1852) - SZCZECHURA, pp. 68-69., Pl. 22., f.1-6.
1978. *Oertliella aculeata* (BOSQUET, 1852) - KEEN, Pl. 10., f. 15.,17.
1984. *Horrificiella aculeata* (BOSQUET, 1852) - GUERNET, p. 124., Pl. 4., f.7.
1985a. *Trahcyleberis aculeata* (BOSQUET, 1852) - MONOSTORI, 1985, pp. 68-71., Pl. VIII., f.1-4.

1985. *Horrificiella aculeata* var. 2 TAMBAREAU, 1972 - DUCASSE et al., Pl. 79., f. 10.
1988. *Horrificiella aculeata* (BOSQUET, 1852) - FAURE et GUERNET, Pl. 1., f.7.

Remarks: Characteristical feature is the very protruding eye tubercle at the cardinal angle. The strength of the spines is somewhat variable.

Dimensions: adult carapaces: L = 0.78 - 0.96 mm, H = 0.46 - 0.54 mm, W = 0.36 - 0.44 mm, L/H = 1.62 - 1.92.

Occurrence: Budapest Area: Budapest, SzOT 1 borehole 16.0 m. Dorog Area: Nyergesújfalu 31 borehole 186.3 - 237.3 m. Mány Area: Mesterberek 76 borehole 322.0 - 313.3 m; Mesterberek 81 borehole 154.0 m; Mesterberek 118 borehole 313.0 - 316.4 m; Csordakút 113 borehole 344.0 - 345.0 m; Csordakút 115 borehole 292.0 m. Mór-Tatabánya Area: Oroszlány 1884 borehole 150.0 - 053.6 m; Oroszlány 2200 580.5 m; Oroszlány 2210 borehole 537.2 - 547.7 m; Oroszlány 2260 borehole 220.5 m; Oroszlány 2266 borehole 198.8 - 220.9 m; Oroszlány 2274 borehole 517.0 m; Oroszlány 2291 borehole 442.0 - 446.0 m; Oroszlány 2301 borehole 417.0 m; Oroszlány 2361 borehole 287.3 - 336.8 m; Oroszlány 2370 borehole 571.9 - 622.5 m; Mór 16 borehole 41.4 - 76.8 m; Tatabánya 1474 borehole 290.6 - 293.7 m; Tatabánya 1481 borehole 123.4 - 126.0, 277.0 - 281.0 m; Tarján 8 borehole 244.7 - 256.3 m; Tarján 9 borehole 403.8 - 407.0 m. Bakony Area: Bakonycsernye 18 borehole 355.0 - 370.0 m; Balinka 333 borehole 550.0 - 555.0 m; Somlóvásárhely 1 borehole 587.3 - 600.7 m; Bakonyszentkirály 4 borehole 366.0 - 388.0 m.

Material: 58 carapaces, 7 left valves, 2 right valves, 133 fragments.

Stratigraphical distribution without Hungary: England: Ypresian to Bartonian; The Netherlands: Bartonian; Belgium: Ypresian to Bartonian; France: Paleocene and Eocene; Germany: Eocene; Ukraina: Paleocene and Eocene.

Stratigraphical range in Hungary: ? Lutetian - Bartonian.

Horrificiella aculeata modesta HINTE, 1962
Pl. 19, f. 1–4.

1962. *Trachyleberis? aculeata modesta* n. ssp. - HINTE, 1962, p. Pl. 3., f. 4.,6., textfig. 9.
1965. *Trachyleberis* aff. *suzakensis* MANDELSTAM, 1959 - URVANOVA, p. 263., Pl. II. F.3.
1973. *Trachyleberis aculeata modesta* VAN HINTE, 1962 - SÖNMEZ-GÖKÇEN, p. 80., Pl. X., f.1-2.

Remarks: The spines has very moderate development, the reticulation dominate. The dorsal spines usually did not go beyond the dorsal outline this is a difference from the HINTE's type material. The mean of the length is about 0.8 mm, that is near to those of the nominate subspecies in the Hungarian eocene.

Dimensions: adult carapaces: L = 0.33 - 0.45 mm, H = 0.62 - 0.82 mm, L/H = 1.81 - 1.94

Occurrence: Mány Area: Tabajd 7 borehole 147.0 - 150.8 m.Tatabánya Area: Oroszlány 2361 borehole 303.0 - 323.0 m; Oroszlány 2370 borehole 574.0 - 609.1 m.

Material: 7 carapaces.

Stratigraphical distribution without Hungary: Austria: Lower Eocene, Turkey: Middle Eocene - L. Oligocene, Ukraina: Lower Eocene.

Stratigraphical range in Hungary: Middle Eocene.

Pterygocythereidini PURI, 1957 tribus
Pterygocythere HILL, 1954 genus

Pterygocythere jonesi (MÉHES, 1936)
Pl. 19, f. 5–8.

1936. *Cytheropteron jonesi* n. sp. - MÉHES, pp. 22-25., Pl. III., f. 1-4.
1977. *Pterygocythere jonesi* (MÉHES, 1936) - MONOSTORI, pp. 81-83., Pl. I., f. 10-12.
1985a. *Pterygocythere jonesi* (MÉHES, 1936) - MONOSTORI, pp. 73-75., Pl. VIII., f. 7-9.
1987. *Pterygocythere jonesi* (MÉHES, 1936) - MONOSTORI, pp. 147-148., Pl. 4., f. 1-2.
1993. *Pterygocythereis cornuta* (ROEMER) - RUSU et al., Pl. II., f. 5.

Remarks: the shape is variable from the short forms with arcuate dorsal outline to the elongate forms with straight dorsal outline.

Dimensions: adult carapaces: L = 0.68 - 1.08 mm, mainly 0.7 - 0.9 mm; H = 0.36 - 0.50 mm, W = 0.43 - 0.55 mm, L/H = 1.53 - 1.97.

Occurrence: Dorog Area: Ótokod pit sample A1, A10, B6, B12; Tokod 527 borehole 210.2 - 339.5 m; Csolnok borehole 296.4 - 387.0 m; Csolnok 699/b borehole 588.4 - 589.8 m; Nyergesújfalu 31 borehole 186.3 - 300.0 m. Mány Area: Csabdi 74 borehole 276.2 - 297.6 m; Csordakút 113 borehole 294.0 - 369.0 m; Csordakút 115 borehole 292.0 - 397.0 m; Mány 55 borehole 424.0 - 511.0 m; Mesterberek 68 borehole 205.0 - 206.0 m; Mesterberek 75 borehole 272.5 - 362.0 m; Mesterberek 76 borehole 298.6 - 389.5 m; Mesterberek 78 borehole 391.5 m; Mesterberek 81 borehole 144.0 - 195.0 m; Mesterberek 118 borehole 304.0 - 388.0 m; Mesterberek 180 borehole 68.0 - 127.6 m. Mór-Tatabánya Area: Oroszlány 1884 borehole 150.0 - 153.6 m; Oroszlány 2200 borehole 578.5 - 581.5 m; Oroszlány 2210 Borehole 542.4 - 555.0 m; Oroszlány 2260 borehole 210.0 - 219.5 m; Oroszlány 2266 borehole 201.0 - 224.7 m; Oroszlány 2274 borehole 477.0 - 523.9 m; Oroszlány 2291 borehole 443.0 m; Oroszlány 2301 borehole 417.0 - 423.3 m; Oroszlány 2361 borehole 334.8 m; Oroszlány 2370 borehole 568.0 m; Tarján 8 borehole 249.6 - 257.4 m; Tarján 9 borehole 368.8 - 418.9 m; Tatabánya 1481 230.2 - 281.0 m; Gánt bauxite pit. Bakony Area: Dudar coal mine.

Material: 237 carapaces, 11 right valves, 18 left valves, 297 fragments.

Stratigraphical range in Hungary: Lutetian - Bartonian.

Echinocythereidini HAZEL, 1967 tribus
Echinocythereis PURI, 1954

Echinocythereis dadayana (MÉHES, 1941)
Pl. 20, f. 1–8, Pl. 21, f. 1–7.

1936. *Cythereis dadayi* n. sp. MÉHES, pp. 40-42., Pl. IV., f. 12-13.
1941. *Cythereis dadayana* nom. nov. - MÉHES, p. 43.
1961. *Echinocythereis multicostata* n. sp. - DELTEL, pp. 163-165., Pl. 16., f. 268-270.
1963. *Echinocythereis multicostata* n. sp. - DELTEL, pp. 189-190., Pl. VI., f. 128-130.
1967. *Echinocythereis septentrionalis* n. sp. - DUCASSE, pp. Pl. IV., f.72.
1969. *Echinocythereis septentrionalis* n. sp. - DUCASSE, p. 114., Pl. VIII., f. 167.
1969. *Echinocythereis multicostata* DELTEL - DUCASSE, p. 112., Pl. VIII., f. 165.
1971. *Echinocythereis septentrionalis* DUCASSE, 1967 - BLONDEAU, p. 45., Pl. IV., f. 15.
1973. *Nucleolina multicostata* (DELTEL, 1963) - SÖNMEZ-GÖKÇEN, pp. 69-70., Pl. IX., f. 5-9.
1977. *Echinocythereis dadayana* (MÉHES, 1941) - MONOSTORI, pp. 102-104., Pl. III., f. 9-11.
1985a. *Echinocythereis dadayana* (MÉHES, 1941) - MONOSTORI, pp. 75-79., Pl. VIII., f. 10-15., Pl. IX., f. 1-11.
1985. *Echinocythereis multicostata* DELTEL, 1964 - DUCASSE et al., Pl. 80., f.7.
1985. *Echinocythereis septentrionalis* DUCASSE, 1967 - DUCASSE et al., Pl. 80., f.9.
1987. *"Echinocythereis" dadayana* (MÉHES, 1941) - MONOSTORI, pp. 148-149., Pl. 4., f.3-4.
1987. *Echinocythereis dadayana* (MÉHES, 1941) - WANEK, GÁBOS et al., Pl. V., f. 5.
1988. *Nucleolina?* cf. *dadayana* (MÉHES, 1936) - BARBIN et GUERNET, p. 220., Pl. 3., f. 9-10.
1993. *Echinocythereis dadayana* (MÉHES) - RUSU et al., Pl. II., f. 8.

Remarks: The species is variable in shape and ornamentation. There is a form with strong posterodorsal, posteroventral and anterior-subcentral swellings, with strong knots on the reticulation. The anterior part is heavily and contrically knoted. The dorsal outline is sinuous because of the projected cardinal angle and posterodorsal swelling. In the dorsal view of the carapace a double wave is visible.

The other extreme form has a mainly reticulated ornamentatin. There is a weak trace of the swellings and knots (latter mainly on the unreticulated posterior part of valve). The anterior part of the valve is nearly smooth. The cardinal angle isn't projecting. The details and strength of the longitudinal and traverse reticulation-elements are very variable.

Dominating although one of the mentioned form in each camples, we have in the matrial a lot ot transitional forms. It is obvious to be a single species with ecological forms.

The genus *Echinocythereis* is a common bathyal form while the *dadayana* is a species accomodated especially to the shallow sublittoral environnement. The fairly ornamented form is characteristic for the shallow lagoons with somewhat variable salinity, the heavily ornamented form lived in shallow marin waters of normal salinity.

At the Priabonian samples the reticulation is more dense and more uniform with less variation (some forms with more weak reticulation near the anterior margin). The swellings are nearly absent. The knots are hardly visible on the posterior part.

Dimensions: adult carapaces: L = 0.61 - 0.86 mm, H = 0.37 - 0.53 mm, L/H = 1.54 - 1.88, W = 0.30 - 0.42 mm.

Occurrence: Budapest Area: Budakeszi 6 borehole 108.3 - 152.2 m. Cserhát Area: Kósd 20 borehole 115.3 -140.5 m. Dorog Area: Tokod, Ebszõny; Ótokod pit, sample A1 - B10; Bajót-Búzáshegy ravine, sample 3,5; Tokod 527 borehole 193.6 - 290.0 m; Lábatlan-Nyergesújfalu river wall sample III/3; Csolnok borehole 296.4 - 329.4 m; Csolnok 699b borehole 517 - 534.0 m; Esztergom 81 borehole 225.6 - 287.8 m; Nyergesújfalu 31 borehole 193.7 - 300.0 m. Mány Area: Csabdi 74 borehole 276.2 / 296.4 m; Csordakút 113 borehole 194.0 - 367.0 m; Csordakút 115 borehole 274.0 - 306.0 m, 378.0 - 406.0 m; Mány 55 borehole 424.0 - 437.0 m, 472.6 - 500.0 m; Mesterberek 46 borehole 94.2 - 94.6 m; Mesterberek 68 borehole 156.0 - 206.0 m; Mesterberek 75 borehole 272.5 - 360.0 m; Mesterberek 76 borehole 302.2 - 411.7 m; Mesterberek 78 borehole 375.0 - 385.0 m; Mesterberek 81 borehole 138.0 - 212.0 m; Mesterberek 88 borehole 269.0 - 289.5 m; Mesterberek 118 borehole 305.0 - 392.0 m; Mesterberek 180 borehole 78.0 - 151.6 m; Tabajd 6 borehole 76.8 - 81.4 m, 143.0 - 148.0 m; Tabajd 7 borehole 144.8 - 150.8 m. Mór-Tatabánya Area: Mór 16 borehole 84.6 - 92.2 m; Oroszlány 2210 borehole 564.4 m; Oroszlány 2266 borehole 208.8 m; Oroszlány 2274 borehole 533.2 - 534.2 m; Oroszlány 2291 borehole 471.4 m; Oroszlány 2301 borehole 421.0 m; Oroszlány 2361 borehole 278.6 - 328.8 m; Oroszlány 2370 borehole 622.5 m; Vs 22 borehole 118.2 - 118.6 m; Várgesztes 1 borehole 95.5 - 97.0 m; Tarján 8 borehole 230.5 - 256.3 m; Tarján 9 borehole 381.9 - 384.3 m; Tatabánya 1474 borehole 322.9 - 323.4 m; Tatabánya 1481 borehole 111.3 - 155.3 m; Gánt, Bagoly hill pit. Bakony Area: Csetény 61 borehole 472.5 m; Somlóvásárhely 1 borehole 551.0 m; Dudar.

Material: 5735 carapaces, 459 right valves, 454 left valves, 369 fragments.

Stratigraphical distribution without Hungary: France: Eocene; Turkey: Bartonian.

Stratigraphical range in Hungary: from Lutetian?, Bartonian - Lower Priabonian.

Echinocythereis sp. 1

Remarks: There are some poorly preserved specimens. Their outline is similar to those of the *E. dadayana*. The ornamentation is more tipically "echinocytherid", but also settled on a distinct reticulation being weaker on the anterior and posterior part and having a parallel orientation ventrally.

Dimensions: adult carapace: L = 1.07 mm, H = 0.58 mm, L/H = 1.85.

Occurrence: Bakony Area: Sümeg, Darvastó pit (Darvastó Formation); Ajka 181 borehole 55.0 m.

Material: 3 carapaces, 4 fragments.

Stratigraphical range in Hungary: Lower Lutetian

Echinocythereis sp. 2
Pl. 21, f. 8.

Remarks: There are some poorly preseved specimens. The knots are distinct in the median part, weak anteriorly and absent on the compressed anterior-anterioventral part.

Dimensions: adult carapaces: L = 0.85 - 0.90 mm, H = 0.52 mm, L/H = 1.62 - 1.74.

Occurrence: Budapest Area: Budapest, Mátyás Hill, Bryozoa marl.

Material: 5 carapaces.

Stratigraphical range in Hungary: Upper Priabonian.

Echinocythereis sp. 3.
Pl. 22, f. 1.

Remarks: Form similar to *E. dadayana* bearing both horizontal irregular costula and knots on the lateral surfaces. The knots are rather rare and strong, the horizontal elements of the reticulation appear as short, undulated and rather sharp costulae. This form is a subspecies of *dadayana* or a new species.

Dimensions: adult carapace: L = 0.73 mm, H = 0.45 mm, L/H = 1.65.

Occurrence: Bakony Area: Bakonyszentkirály 4 borehole 370.0 m.

Material: 2 carapaces.

Stratigraphical range in Hungary: Bartonian.

Henryhowella PURI, 1957 genus

Henryhowella asperrima (REUSS, 1850) s.l.
Pl. 22, f. 2–3.

1850. *Cypridina asperrima* n. sp. - REUSS, p. 74., T. X., f. 5.
1976. *Henryhowella asperrima* (REUSS, 1850) - BENSON *in* BERGGREN et al., Pl. VI., f.4.
1976. *Henryhowella asperrima* (REUSS) - CHINTAUAN et NICORICI, pp. 15-16., Pl. III. F. 6-7
1978. *Henryhowella asperrima* (REUSS) - BENSON, Pl. 1., f. 3.
1978. *Henryhowella asperrima* (REUSS) - BRESTENSKÁ et JIRICEK, Pl. 8., f.8.
1981. *Henryhowella asperrima* (REUSS, 1850) - BRESTENSKÁ et CARBONNEL, p. 175., Pl. XIII., f.5.
1981. *Henryhowella asperrima* (REUSS, 1850) s.l. - UFFENORDE, pp. 148-149., Pl.2., f. 14-15., 17-19.
1982. *Henryhowella asperrima* (REUSS, 1850) - MONOSTORI, 1982, pp. 60-62., Pl. VI., f.3-5. (cum syn. 1851 - 1975).
1983. *Henryhowella asperrima* (REUSS, 1850) - RIHA, textfig. 20., Pl. 4., f. 23.
1984. *Henryhowella asperrima* (REUSS, 1850) - MALZ et JELLINEK, T. 5., f. 38-39.
1984. *Henryhowella asperrima* (REUSS, 1860) - RIHA, 1984, Pl. 1., f.1-2.
1985. *Henryhowella asperrima* (REUSS, 1850) - CARBONEL, Pl. 96., f.4-5.
1985. *Henryhowella* gr. *asperrima* (REUSS, 1850) - DUCASSE et al., Pl. 80., f. 10-11.
1985b. *Henryhowella asperrima* (REUSS, 1850) - MONOSTORI, pp. 195-196., Pl. 5., f.5-6.

1986., *Henryhowella* gr. *asperrima* (REUSS, 1850) - LÁZARO et al., Pl. IV., f.1.
1987. *Henryhowella asperrima* (REUSS, 1850) - ARANKI, pp. 64-65., Pl. 5., f.1-2.
1993. *Henryhowella asperrima* (REUSS) - NACHITE et al., Lám. IV., f.7-8.
1993. *Henryhowella asperrimaa* (REUSS, 1850) - KEMPF et NINK, pp. 95-114., Abb. 1-30.
1994. *Henryhowella* cf. *asperrima* (REUSS, 1850) - GUERNET et MOULLADE, pp. 268-270., Pl.3., f. 8-11., 14., 17.

Remarks: This species is mentioned from the Eocene to Recent. There is a new revision of the species from the type locality (KEMPF et NINK, 1993) and it seems to be necessary re-examinating another materials. The supervision of the considerable materials of hungarian Paleogene will be finished in a work about the Oligocene ostracods of Hungary. The few specimens from Eocene show a considerable variation in ornamentation, mainly in appearance of longitudinal swellings and reticulation. The probable instars are without swellings. Unusual is their sporadic occurrence in the bathyal Priabonian bearing ostracod fauna similar to those of Bartonian and Kiscellian (Rupelian).

Dimensions: adult left valves: L = 0.66 - 0.78 mm, H = 0.38 - 0.46 mm, L/H = 1.65 - 1.80. Instar(?) left valves: L = 0.59 - 0.62 mm, H = 0.35 - 0.38 mm, L/H = 1.63 - 1.72.

Occurrence: Budapest Area: Budapest (Pusztaszeri str.); Budapest (Váradi str.); Budapest, Vár Hill. Bakony Area: Somlóvásárhely 1 borehole 585.5 - 613.3 m; Padragkút outcrop, sample 13.

Material: adults: 2 carapaces, 6 left valves, 4 right valve, 6 fragments. Instars (?): 2 carapaces, 5 left valves, 6 right valves, 1 fragment.

Stratigraphical distribution without Hungary: Europa: Eocene - Recent (see remarks).

Stratigraphical range in Hungary: Middle Eocene - Upper Oligocene.

Campylocytherinae PURI, 1960 subfamilia
Leguminocytherini HOWE, 1961 tribus
Leguminocythereis HOWE et LAW, 1936 genus

Leguminocythereis dudarensis MONOSTORI, 1987
Pl. 22, f. 4.

1987. *Leguminocythereis dudarensis* n. sp. - MONOSTORI, pp. 149-150., Pl. 4., f. 7-8.

Remarks: the indistinct character of the ornamentation appear on the anterior half of valves.

Dimensions: left valves: L = 0.80 - 0.83 mm, H = 0.46 - 0.48 mm, L/H = 1.79 - 2.00; right valve: L = 0.88 - 0.94 mm, H = 0.48 - 0.50 mm, L/H = 1.68 - 1.88.

Occurrence: Bakony Area: Dudar, infills of Naticidae from Naticidae - sand; Somlóvásárhely 1 borehole 834.7m, 835.0 m.

Material: 6 right valves, 2 left valves, 4 juvenile right valves, 2 juvenile left valves.

Stratigraphical range in Hungary: Upper Lutetian - Lower Bartonian.

Leguminocythereis inflata DUCASSE, 1963
Pl. 22, f. 5.

1963. *Leguminocythereis inflata* DUCASSE n. sp. - DUCASSE, pp. 235-236., Pl. III., f. 26-27.
1969. *Leguminocythereis inflata* DUCASSE, DUCASSE, p. 124., Pl. IX., f. 181.
1971. *Leguminocythereis inflata* DUCASSE - BLONDEAU, p. 48., Pl. V., f. 10.
1985. *Leguminocythereis inflata* DUCASSE - DUCASSE et al., Pl. 81., f.3.
1988. *Leguminocythereis inflata* DUCASSE - DUCASSE et ROUSSELLE, pp. 141-144., Pl. 2., f. 2-00., Pl. 3. F. 1-11.

Remarks: it is similar to "morpha pérennante" in DUCASSE et ROUSSELLE (1988), but the anterodorsal part of the ornamentation is more weak.

Dimensions: adult right valve: L = 0.95 mm, H = 0.55 mm, L/H = 1.73.

Occurrence: Bakony Area: Somlóvásárhely 1 borehole 546.7 m.

Material: 1 right valve.

Stratigraphical distribution without Hungary: France, Eocece.

Stratigraphical range in Hungary: Lower Priabonian.

Leguminocythereis pertusa erasiforma n. ssp.
Pl. 22, f. 6.

Derivatio nominis: named after similarity to *L. erasa* DUCASSE, 1967.

Holotype: adult right valve.

Locus typicus: Dudar, Hungary.

Stratum typicum: Upper Lutetian - Lower Bartonian molluscan marl.

Diagnosis: dorsally and laterally hardly ornamented form with equally and symmetrically arched dorsal and ventral outlines.

Comparison and remarks: it has an ornamentation very similar to *L. erasa* DUCASSE, 1967 (hardly visible costae or reticulation on dorsal and lateral surface, and four parallel costae ventrally).

In contrast to the *erasa* the ventral outline nearly symmetrical, the symmetrical dorsal outline more arched, between the dorsal and posterior outline there is a characteristic enbayment.

According to DUCASSE et ROUSSELLE (1988) the *erasa* (U. Eocene - L. Oligocene) and *aquitaine* (M. Eocene)) only ecological morphas of *pertusa,* but they are distinct in time, so they possible to be temporal subspecies, and our form also is a subspecies.

Dimensions: adult right valve: L = 1.08 mm, H = 0.63 mm, L/H = 1.71.

Occurrence: Bakony Area: Dudar, from infillings of Velates schmidelianus of sandy marls.

Material: 1 right valve.

There is a hardly preserved right valve in Somlóvásárhely 1 borehole 546.7 m with similar ornamentation, but it is dorsally stronger arched and less in dimensions: L = 0.80 mm, H = 0.46 mm, L/H = 1.60.

Stratigraphical range in Hungary: Upper Lutetian - Lower Bartonian.

Leguminocythereis striatopunctata angulata n. ssp.
Pl. 22, f. 7–8.

Derivatio nominis: named after the anterodorsal and posterodorsal projections.

Holotype: carapace.

Locus typicus: Mesterberek 180 borehole.

Stratum typicum: 104.8 - 107.0 m; Bartonian marl.

Diagnosis: The caudal angle and the posterodorsal angle are projected, the dorsal outline sinuous.

Remarks: there is a large variation in the species according to different authors. Some of these are ecological "morpha" in DUCASSE et ROUSSELLE's opinion. There is no figured form in literature with caracteristical projected antero- and posterodorsal angles. The anterior and posterior part are much higher, as at the type, the form has a "quadrangular" character.

Dimensions: adult left valve L = 0.88 mm, H = 0.49 mm, L/H = 1.78. Adult carapaces: L = 0.85 - 0.90 mm, H = 0.47 - 0.49 mm, W = 0.54 - 0.55 mm, L/H = 1.82 - 1.83.

Occurrence: Dorog Area: Tokod, Ebszõny outcrop. Mány Area: Mesterberek 180 borehole 104.8 - 107.0 m, 187.5 m, 189.0 m; Csabdi 74 borehole 262.5 - 264.6 m, 279.6 - 280.4 m; Tabajd 6 borehole 143.0 - 148.0 m. Tatabánya Area: Oroszlány 2301 borehole 417.0 m.

Material: 1 left valve, 5 carapaces, 8 fragments.

Stratigraphical range in Hungary: Bartonian.

Leguminocythereis sp. div.

Remarks: Fragmental and poorly preserved specimens of different species.

Occurrence: Bakony Area: Csabrendek 850. Borehole 87.2 - 87.8 m; Somlóvásárhely 1 borehole 541.7 m, 551.0 m; Sümeg Darvastó outcrop.

Material: 1 poorly preserved left valve, 1 poorly preserved right valve, 1 poorly preserved carapace, 4 fragments.

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Plate 1.

Figs 1-7. *Cytheromorpha zinndorfi hungarica* MONOSTORI, 1985.
Middle Eocene (Bartonian)
Fig. 1. Carapace from the left valve. 150x
Fig. 2. Carapace from the right valve. 156x
Tokod 527 borehole 345.0-345.9 m
Fig. 3. Carapace from dorsal side. 162x
Esztergom 81 borehole 287.8-290.4 m.
Fig. 4. Carapace from the right valve. 164x
Csordakút 113 borehole 373.0 m
Fig. 5. Carapace from the right valve. 162x
Csordakút 115 borehole 412.0 m
Fig. 6. Carapace from the left valve. 168x
Csabdi 74 borehole 295.6-296.5 m
Fig. 7. Carapace from dorsal side. 151 x
Mesterberek 76 borehole 421.2 m

Plate 2.

Figs 1-6. *Paijenborchella eocaenica* TRIEBEL, 1949
Fig. 1. Carapace from the left valve. 95x
Kósd 20 borehole 124.4-127.1 m
Upper Eocene (Lower Priabonian)
Fig. 2. Carapace from the left valve. 119x
Mesterberek 75 borehole 282.0 m
Fig. 3. Carapace from the right valve. 134x
Mesterberek 76 borehole 306.0 m
Fig. 4. Carapace from the left valve. 108 x
Mesterberek 76 borehole 309.1 m
Fig. 5. Carapace from the left valve. 126 x
Mesterberek 118 borehole 309.0 m
Fig. 6. Carapace from dorsal side. 113x
Mesterberek 118 borehole 309.0 m
Figs 2-6: Middle Eocene (Bartonian)
Figs 7-8. *Paijenborchella* aff. *eocaenica* TRIEBEL, 1949.
Upper Eocene (Lower Priabonian)
Fig. 7. Carapace from the left valve. 98x
Budakeszi 6 borehole 150.2-152.2 m
Fig. 8. Carapace from the left valve. 100x
Budakeszi 6 borehole 121.3-122.8 m

Plate 3.

Figs 1-3. *Paijenborchella lomata* TRIEBEL, 1949.
Middle Eocene (Bartonian)
Fig. 1. Carapace from the left valve. 118x
Csabdi 74 borehole 276.2-279.6 m
Fig. 2. Carapace from left valve. 118x
Tatabánya 1481 borehole 127.0-129.8 m
Fig. 3. Carapace from the right valve. 103x
Mór 16 borehole 66.6-66.9 m
Fig. 4. *Cytheridella gantensis* MONOSTORI, 1977.
Middle Eocene (Bartonian)
Left valve. 96x
Gánt, Bagolyhegy pit
Figs 5-8. *Clithrocytheridea faboides gantensis* MONOSTORI, 1977.
Middle Eocene (Bartonian)
Fig. 5. Left valve. 172x
Gánt, Bagolyhegy pit
Fig. 6. Right valve. 162x
Gánt, Bagolyhegy-pit

Fig. 7. Inside of the left valve. 172x
Gánt, Bagolyhegy pit
Fig. 8. Carapace from the left valve. 161x
Tatabánya 1481 borehole 178.0-181.0 m

Plate 4.

Figs 1-8. *Clithrocytheridea faboides gantensis* MONOSTORI, 1977.
Middle Eocene (Bartonian)
Fig. 1. Carapace from the left valve. 152x
Fig. 2. Carapace from the right valve. 147x
Tokod 527 borehole 210.2-213.8 m
Fig. 3. Carapace from the left valve. 141x
Csordakút 113 borehole 345.0 m
Fig. 4. Carapace from the right valve. 141x
Csordakút 113 borehole 314.0 m
Fig. 5. Carapace from the right valve. 136 x
Mesterberek 76 borehole 358.0 m
Fig. 6. Carapace from the right valve. 136x
Mesterberek 180 borehole 104.8-107..0 m
Fig. 7. Carapace from the right valve. 141x
Mány 55 borehole 431.0 m
Fig. 8. Carapace from the left valve. 151x
Mány 55 borehole 434.0 m

Plate 5.

Figs 1-4. *Clithrocytheridea kosdensis* n. sp.
Upper Eocene (Lower Priabonian)
Fig. 1. Right valve. 115x
Kósd 20 borehole 136.5-137.3 m
Fig. 2. Carapace from dorsal side. 104x
Kósd 20 borehole 137.3-140.5 m
Fig. 3. Carapace from the left valve. 126x
Kósd 20 borehole 144.5-147.3m.
Holotypus
Fig. 4. Carapace from the left valve. 108x
Kósd 20 borehole 144.5-147.3 m
Fig. 5. *Clithrocytheridea* sp. 1. 97x
Mesterberek 78 borehole 377.0 m.
Middle Eocene (Bartonian)
Figs 6-8. *Neocyprideis williamsoniana* (BOSQUET, 1852).
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 6. Right valve. 86x
Dudar, mollusc sand

Fig. 7. Left valve. 72x
Csolnok borehole 258.3-259.0 m
Fig. 8. Left valve. 81x
Tabajd 7 borehole 178.2-178.6 m

Plate 6.

Figs 1-8. *Cytheridea fraudator* MONOSTORI, 1985.
Middle Eocene (Bartonian)
Fig. 1. Carapace from the left valve. 86x
Tokod 527 borehole 226.2-227.9 m
Fig. 2. Right valve. 67x
Esztergom 81 borehole 264.2-264.8 m
Fig. 3. Carapace from dorsal side. 97x
Ótokod pit, Sample A5.
Fig. 4. Carapace from the right valve. 86x
Csolnok 113 borehole 306.0 m
Fig. 5. Carapace from dorsal side. 86x
Csolnok 113 borehole 306.0 m
Fig. 6. Carapace from the right valve. 86x
Csolnok 113 borehole 306.0 m
Fig. 7. Carapace from the left valve. 84x
Csolnok 113 borehole 306.0 m
Fig. 8. Inside of the left valve. 84x
Mesterberek 76 borehole 3254 m

Plate 7.

Figs 1-6. *Schuleridea mirkmalovi* SAKINA, 1971.
Middle Eocene (Bartonian)
Fig. 1. Carapace from the right valve. 75x
Somlóvásárhely 1 borehole 670.0 m
Fig. 2. Right valve. 73x
Somlóvásárhely 1 borehole 671.2 m
Fig. 3. Carapace from the left valve. 75x
Somlóvásárhely 1 borehole 671.6 m
Fig. 4. Carapace from dorsal side. 75x
Somlóvásárhely 1 borehole 674.3 m
Fig. 5. Right valve. 67x
Somlóvásárhely 1 borehole 674.8 m
Fig. 6. Carapace from left valve. 67x
Somlóvásárhely 1 borehole 679.5 m
Figs 7-8. *Schuleridea perforata* (ROEMER, 1838)
Fig. 7. Carapace from the left valve. 72x
Kósd 20 borehole 1244-127.4 m

Fig. 8. Carapace from the right valve. 72x
Kósd 20 borehole 124.4-127.4 m.
Upper Eocene (Lower Priabonian)

Plate 8.

Figs 1-8. *Schuleridea perforata* (ROEMER, 1838)
Fig. 1. Carapace from dorsal side. 94x
Kósd 20 borehole 124.4-127.4 m.
Upper Eocene (Lower Priabonian)
Fig. 2. Carapace from the left valve. 75x
Mesterberek 75 borehole 370.0 m
Fig. 3. Carapace from the left valve. 72x
Mesterberek 76 borehole 392.5 m
Fig. 4. Carapace from the left valve. 75x
Csordakút 113 borehole 298.0 m
Fig. 5. Carapace from the right valve. 65x
Csordakút 113 borehole 314.0 m
Fig. 6. Inside of left valve. 67x
Mesterberek 76 borehole 352.5 m
Fig. 7. Carapace from dorsal side. 92x
Mesterberek 76 borehole 315.5 m
Fig. 8. Carapace from dorsal side. 86x
Csordakút 115 borehole 391.0 m
[Figs 2-8. Middle Eocene (Bartonian)]

Plate 9.

Fig. 1. *Schuleridea perforata* (ROEMER, 1838).
Middle Eocene (Bartonian)
Carapace from right side. 75x
Tarján 8 borehole 255.2-256.3 m
Fig. 2. *Schuleridea* aff. *perforata* (ROEMER, 1838).
Middle Eocene (Bartonian)
Carapace from the left valve. 75x
Mesterberek 76 borehole 392.5 m
Figs 3-5. *Monsmirabilia kosdensis* n. sp.
Upper Eocene (Lower Priabonian)
Fig. 3. Carapace from the left valve. 86x
Kósd 20 borhole 1145-116.5 m.
Holotypus
Fig. 4. Carapace from the left valve. 86x
Kósd 20 borehole 114.5-116.5 m
Fig. 5. Carapace from dorsal side. 114x
Kósd 20 borehole 124.4-127.4 m

Figs 6-8. *Monsmirabilia triebeli* KEIJ, 1957.
Middle Eocene (Bartonian)
Carapaces from dorsal side
Fig. 6. Csordakút 115 borehole 249.0 m 108x
Fig. 7. Csolnok 699/b borehole 525.5-528.0 m 118x
Fig. 8. Mesterberek 75 borehole 282.0 m 116x

Plate 10.

Figs 1-8. *Monsmirabilia triebeli* KEIJ, 1957
Fig. 1. Carapace from the left valve. 103x
Mány 55 borehole 430.0 m.
Middle Eocene (Bartonian)
Fig. 2-8. Carapaces from the right valve
Fig. 2. Somlóvásárhely 1 borehole 836.9 m. 97x.
Middle Eocene (Lutetian)
Fig. 3. Mesterberek 180 borehole 80.6 m. 113x
Fig. 4. Mesterberek 81 borehole 147.0 m. 108x
Fig. 5. Csordakút 113 borehole 297.0 m. 118x
Fig. 6. Mesterberek 81 borehole 144.0 m. 118x
Fig. 7. Mesterberek 81 borehole 146.0 m. 108x
Fig. 8. Mesterberek 75 borehole 329.0 m. 108x
Figs 3-8. Middle Eocene (Bartonian)

Plate 11.

Fig. 1. *Monsmirabilia* n. sp. 1.
Middle Eocene (Lower Lutetian)
Left valve. 86x
Sümeg, Darvastó pit.
Figs 2-3. *Krithe angusta* DELTEL, 1961
Middle Eocene (Uppermost Bartonian)
Fig. 2. Right valve. 67x
Somlóvásárhely 1 borehole 587.3 m
Fig. 3. Carapace from the right valve. 69x
Somlóvásárhely 1 borehole 592.4 m
Figs 4-8. *Krithe bartonensis* (JONES, 1857) s.l.
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 4. Inside of the left valve. 120x
Nyergesújfalu 31 borehole 234.5-236.2 m
Fig. 5. Inside of the left valve. 97x
Gánt, bauxite pit.
Fig. 6. Inside of the right valve. 109x
Gánt, bauxite pit

Fig. 7. Inside of the right valve. 97x
Dudar, mollusc sand
Fig. 8. Carapace from dorsal side
Mesterberek 76 borehole, 322,1 m

Plate 12.

Figs 1-8. *Krithe bartonensis* (JONES, 1857) s.l.
Fig. 1. Left valve. 97x
Dudar, mollusc sand
Fig. 2. Carapace from the right valve. 97x
Tokod 527 borehole 248.8-252.5 m
Fig. 3. Carapace from the right valve. 90x
Mesterberek 75 borehole 280.0 m
Fig. 4. Carapace from the right valve. 87x
Mesterberek 76 borehole 322.1 m
Fig. 5. Carapace from the right valve. 97x
Mesterberek 75 borehole 356.0 m
Fig. 6. Carapace from the right valve. 84x
Csordakút 113 borehole 364.0 m
Fig. 7. Carapace from the right valve. 75x
Oroszlány 2370 borehole 568.0 m
Fig. 8. Carapace from the right valve. 97x
Kósd 20 borehole 137.3-141.5 m
Figs 1-7: Middle Eocene (Upper Lutetian-Bartonian)
Fig. 8: Upper Eocene (Lower Priabonian)

Plate 13.

Figs 1-2. *Krithe* aff. *curvidorsalis* MANDELSTAM *in* ROSYEVA, 1962
Upper Eocene (Upper Priabonian)
Fig. 1. Right valve. 90x
Budapest, Vár Hill
Fig. 2. Carapace from the right valve. 75x
Budapest, SzOT 1 borehole 7.0 m
Figs 3-5. *Krithe kollmanni* POKORNÝ, 1980
Middle Eocene (Uppermost Bartonain)
Fig. 3. Carapace from the right valve. 73x
Somlóvásárhely 1 borehole 584.3 m
Fig. 4. Inside of the right valve. 83x
Somlóvásárhely 1 borehole 585.5 m
Fig. 5. Carapace from dorsal side. 78x
Somlóvásárhely 1 borehole 585.5 m

Figs 6-8. *Krithe parapernoides* n. sp.
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 6. Carapace from the left valve. 63x
Csolnok 699/b borehole 576.5-587.5 m
Fig. 7. Left valve. 67x
Oroszlány 2210 borehole 546.1 m
Fig. 8. Carapace from the right valve. 64x
Oroszlány 2370 borehole 615.7 m. Holotypus

Plate 14.

Figs 1-4. *Krithe parapernoides* n. sp.
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 1. Carapace from the right valve. 64x
Oroszlány 2370 borehole 568.0 m
Fig. 2. Carapace from the right valve. 67x
Tatabánya 1474 borehole 290.6-293.7 m
Fig. 3. Carapace from the right valve. 56x
Csetény 61 borehole 462.5 m
Fig. 4. Carapace from dorsal side. 64x
Oroszlány 2370 borehole 617.1 m
Figs 5-8. *Krithe pernoides* (BORNEMANN, 1855) s.l.
Upper Eocene (Upper Priabonian)
Fig. 5. Carapace from the left valve. 86x
Budapest, Pusztaszeri street, sample 2.
Fig 6. Carapace from dorsal side. 91x
Budapest, Pusztaszeri street, sample 20
Fig. 7. Carapace from the left valve. 95x
Budapest, Pusztaszeri street, sample 21
Fig. 8. Carapace from the left valve. 97x
Budapest, Pusztaszeri street, sample 21

Plate 15.

Figs 1-3. *Krithe pernoides* (BORNEMANN, 1855) s.l.
Fig. 1. Carapace from the right valve. 92x
Budapest, Pusztaszeri street, sample 24
Fig. 2. Inside of the left valve. 72x
Budapest, Kelenhegyi street
Figs 1-2: Upper Eocene (Upper Priabonian)
Fig. 3. Carapace from the left valve. 96x
Csetény 61 borehole 455.0 m
Middle Eocene (Upper Lutetian-Bartonian)

Figs 4-6. *Turmaekrithe fragilis* PIETRZENIUK, 1969
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 4. Carapace from the left valve. 144x
Balinka 333 borehole 550.0-555.0 m
Fig. 5. Carapace from the right valve. 132x
Csordakút 115 borehole 304.0 m
Fig. 6. Carapace from the left valve. 102x
Csordakút 115 borehole 310.6-316.3 m
Fig. 7. *Parakrithe* aff. *costatomarginata* MONOSTORI, 1982
Upper Eocene (Upper Priabonian)
Carapace from the right valve. 116x
Budapest, Pusztaszeri street, sample 21
Fig. 8. *Trachyleberis spinosa* LIENENKLAUS, 1900
Middle Eocene (Bartonain)
Carapace from dorsal side. 110x
Oroszlány 2361 borehole 311.2 m

Plate 16.

Figs 1-4. *Trachyleberis spinosa* LIENENKLAUS, 1900
Middle Eocene (Bartonian)
Fig. 1. Carapace from the left valve. 108x
Mór 16 borehole 52.5-54.2 m
Fig. 2. Carapace from the right valve. 96x
Oroszlány 2291 borehole 442.0 m
Fig. 3. Carapace from the right valve. 100x
Oroszlány 2291 borehole 453.0 m
Fig. 4. Carapace from the left valve 110x
Bakonyszentkirály 4 borehole 390.0 m
Figs 5-7. *Trachyleberidea prestwichiana* (JONES et SHERBORN, 1887) s.l.
Middle Eocene (Uppermost Bartonian)
Fig. 5. Carapace from the left valve. 77x
Somlóvásárhely 1 borehole 591.9 m
Fig. 6. Carapace from the right valve. 79x
Somlóvásárhely 1 borehole 594.2 m
Fig. 7. Carapace from dorsal side 77x
Somlóvásárhely 1 borehole 607.8 m
Fig. 8. *Phalcocythere horrescens* (BOSQUET, 1852)
Middle Eocene (Upper Lutetian-Bartonian)
Right valve. 112x
Dudar, mollusc sand

Plate 17.

Fig. 1. *Phalcocythere horrescens* (BOSQUET, 1852)
Middle Eocene (Upper Lutetian-Bartonian)
Left valve. 107x
Dudar, mollusc sand
Figs 2-4. *Phalcocythere budakesziensis* n. sp.
Upper Eocene (Lower Priabonian)
Fig. 2. Carapace from the right valve. 99x
Budakeszi 6 borehole 150.2-152.2 m
Holotypus
Fig. 3. Carapace from the left valve. 94x
Budakeszi 6 borehole 150.2-152.2 m
Fig. 4. Carapace from dorsal side. 79x
Budakeszi 6 borehole 150.2-152.2 m
Fig. 5. *Phalcocythere sumegensis* n. sp.
Middle Eocene (Lower Lutetian)
Right valve. 116x
Sümeg, Darvastó
Holotypus
Fig. 6. *Costa* cf. *hermi* WITT, 1967
Upper Eocene (Upper Priabonian)
Right valve. 86x
Budapest, Pusztaszeri street, sample 21
Figs 7-8. *Agrenocythere ordinata* (DELTEL, 1961)
Upper Eocene (Upper Priabonian)
Fig. 7. Carapace from the left valve. 58x
Budapest, Pusztaszeri street, sample 3
Fig. 8. Carapace from the right valve. 60x
Budapest, Pusztaszeri street, sample 17

Plate 18.

Figs 1-3. *Agrenocythere ordinata* DELTEL, 1961
Middle Eocene (Bartonian)
Fig. 1. Carapace from the left valve. 60x
Padragkút outcrop, sample 13
Fig. 2. Carapace from the right valve. 60x
Padragkút outcrop, sample 13
Fig. 3. Carapace from dorsal side. 60x
Padragkút outcrop, sample 13

Fig. 4. *Hazelina indigene* MOOS, 1966
Upper Eocene (Uppermost Priabonian)
Left valve, 88x
Síkfőkút quarry, sample 15

Figs 5-8. *Horrificiella aculeata* (BOSQUET, 1852)
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 5. Carapace from the left valve 77x
Oroszlány 2361 borehole 287.3 m
Fig. 6. Carapace from the left valve. 83x
Tarján 8 borehole 255.2-256.3 m
Fig. 7. Carapace from the right valve. 74x
Oroszlány 2361 borehole 330.9 m
Fig. 8. Carapace from dorsal side. 74x
Oroszlány 2370 borehole 622.5 m

Plate 19.

Figs 1-4. *Horrificiella aculeata modesta* HINTE, 1962
Middle Eocene (Bartonian)
Fig. 1. Carapace from the right valve. 82x
Oroszlány 2361 borehole 303.0 m
Fig. 2. Carapace from the left valve. 80x
Oroszlány 2370 borehole 599.1 m
Fig. 3. Carapace from the right valve. 80x
Oroszlány 2370 borehole 574.5 m
Fig. 4. Carapace from the left valve. 100x
Tabajd 7 borehole 147.0-150.8 m

Figs 5-8. *Pterygocythere jonesi* (MÉHES, 1936)
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 5. Left valve (short form) 80x
Csabdi 74 borehole 276.2-279.8 m
Fig. 6. Right valve (intermediate form) 82x
Csabdi 74 borehole 276.2-279.8 m
Fig. 7. Carapace from the right valve. 66x
Tarján 9 borehole 368.8-372.2 m
Fig. 8. Left valve (elongated form) 68x
Dudar, mollusc sand

Plate 20.

Figs 1-8. *Echinocythereis dadayana* (MÉHES, 1941)
Middle Eocene (Upper Lutetian-Bartonian)
Fig. 1. Left valve. 79x
Gánt, bauxite pit

Fig. 2. Inside of left valve. 88x
Dudar, mollusc sand
Fig. 3. Left valve. 88x
Oroszlány 2361 borehole 287.3 m
Fig. 4. Carapace from the right valve. 80x
Mesterberek 78 borehole 385.0 m
Fig. 5. Carapace from dorsal side. 80x
Oroszlány 2361 borehole 307.0 m
Fig. 6. Carapace from the right valve. 77x
Oroszlány 2361 borehole 307.1 m
Fig. 7. Carapace from the left valve. 88x
Mány 55 borehole 431.0 m
Fig. 8. Carapace from dorsal side. 88x
Mány 55 borehole 431.0 m

Plate 21.

Figs 1-7. *Echinocythereis dadayana* (MÉHES, 1941)
Fig. 1. Carapace from the right valve. 83x
Mány 55 borehole 426.0 m
Fig. 2. Carapace from the right valve. 80x
Mesterberek 180 borehole 104.8-107.0 m
Fig. 3. Carapace from the right valve. 77x
Esztergom 81 borehole 264.2-264.8 m
Figs 1-3: Middle Eocene (Bartonian)
Fig. 4. Carapace from the left valve. 75x
Budakeszi 6 borehole 114.5-116.5 m
Fig. 5. Carapace from the right valve. 75x
Budakeszi 6 borehole 114.5-116.5 m
Fig. 6. Carapace from dorsal side. 75x
Budakeszi 6 borehole 114.5-116.5 m
Fig. 7. Carapace from the left valve. 77x
Budakeszi 6 borehole 150.0-152.0 m
Figs 4-7: Upper Eocene (Lower Priabonian)
Fig. 8. *Echinocythereis* sp. 2
Upper Eocene (Upper Priabonian)
Budapest, Szépvölgy, bryozoa marl

Plate 22.

Fig. 1. *Echinocythereis* sp. 3
Middle Eocene (Bartonian)
Carapace from the left valve. 71x
Bakonyszentkirály 4 borehole 370.0 m
Figs 2-3. *Henryhowella asperrima* (REUSS, 1850) s.l.
Fig. 2. Right valve. 88x
Somlóvásárhely 1 borehole 585.5 m
Upper Eocene (Lowermost Priabonian)
Fig. 3. Left valve. 99x
Padragkút ravine, sample 13
Middle Eocene (Bartonian)
Fig. 4. *Leguminocythereis dudarensis* MONOSTORI, 1987
Middle Eocene (Upper Lutetian-Bartonian)
Right valve. 68x
Dudar, mollusc sand
Fig. 5. *Leguminocythereis inflata* DUCASSE, 1963
Upper Eocene (Lower Priabonian)
Carapace from the right valve. 63x
Somlóvásárhely 1 borehole 546.7 m
Fig. 6. *Leguminocythereis pertusa erasiforma* n. ssp.
Middle Eocene (Upper Lutetian-Bartonian)
Right valve. 66x
Dudar, mollusc sand
Holotypus
Figs 7-8. *Leguminocythereis striatopunctata angulata* n.ssp.
Middle Eocene (Bartonian)
Fig. 7. Carapace from the left valve. 66x
Mesterberek 180 borhole 104.8-107.0 m
Holotypus
Fig. 8. Carapace from dorsal side. 68x
Mesterberek 180 borehole 104.8-107.0 m

Annales Univ. Sci. Budapest., Sect. Geol. 31, 75—105 (1996) Budapest

Catalogue of the Hantken collection: carbonate microfacies photographs from 1872–82

Miklós KÁZMÉR[1]

(with 2 tables)

Abstract

Maximilian Hantken (1821–1893), founding professor of the Department of Palaeontology at Budapest University, was a pioneer in stratigraphic micropalaeontological studies. He assembled a collection of microphotographs of Mesozoic and Cenozoic carbonate rocks from Hungary and Italy for educational purposes. A catalogue of the 232 photos, mounted on wooden boards or cardboard is given here. The photos date back to the decade between 1872 and 1882, as shown by newspaper cuts pasted on the backsides.

Introduction

A collection of 232 photographs of carbonate microfacies visible in thin sections has been preserved at the Department of Palaeontology, Eötvös University, Budapest. The photographs were made by the founding professor of the department, Maximilian HANTKEN, in the years 1872–1882. The photographs – pasted on thin, wooden or cardboard plates – served teaching purposes.

HANTKEN put much effort into establishing collections in the field of palaeontology. Their scientific value was further raised by the aesthetic appeal. His famous 'green cassettes', preparates of the foraminifer *Nummulites*, have won a Gold Medal at the World Exhibition of Vienna in 1873 (KECSKEMÉTI, 1987b).

Hantken's activity as scientist and educator has been extensively reviewed (see studies in HÁLA, 1987). A brief review of his collection preserved at the Department of Palaeontology, Eötvös University is available (KÁZMÉR, 1987). The present paper aims to publish the catalogue of this valuable collection to make it available for further research.

[1]Department of Palaeontology, Eötvös University, H–1083 Budapest, Ludovika tér 2, Hungary

Hantken's science and teaching

Maximilian HANTKEN (1821–1893) studied at the Mining Academy at Schemnitz in Hungary. He worked as mining engineer mostly for coal mining companies (1846–1861), taught science at the School of Commerce at Pest (1861–1866), was curator of the botanical and mineralogical collections of the Hungarian National Museum (1866–1868). He was founding director of the Royal Hungarian Geological Institute (1869–1881). He established the Department of Palaeontology at Budapest University (1882) and served as professor there until his death.

HANTKEN is best known for his pioneering work in Tertiary micropalaeontology. His studies were strongly application-oriented, establishing the science of stratigraphic micropalaeontology (KECSKEMÉTI, 1987a). He was an obsessed teacher, developing new methods of education in his favourite field of micropalaeontology. The photographic collection discussed here is one of the results of his pioneering activities.

Unfortunately, Hantken never published his photographs of limestone microfacies (HANTKEN, 1884 is a preliminary communication only, with no illustration). A single exception is two microphotos of the Italian Upper Cretaceous Scaglia beds (Plate IV of HANTKEN (1883): the corresponding photographs are K.1034 and K. 1032). Although he was a pioneer of microfacies studies, his results got less reflections than deserved.

The photographs

There are 90 large and 142 small photographs in the collection. Both sets contain wood-mounted and paper-mounted photos.

Most photographs are pasted on wooden boards. The larger boards are generally 167 mm wide, 193 mm high, and 6 mm thick. There is a photo of 130 mm in diametre pasted in the centre. Rock name plus stratigraphic age is shown on a small label (54×17 mm) attached above the photo, while locality is on another label of the same size attached below.

The smaller wooden boards are 90 mm wide, 112 mm high, and 5 mm thick. The microphoto in the centre is 75 mm in diametre. The rock and age labels above, and the locality labels below are approx. 5×1.5 cm in size.

Some photos are on thin paper boards of variable thickness. The larger paper boards are about 17 cm wide and 16.5 cm high. A 136×136 mm photographic paper is glued to the centre, displaying a circular microphoto of 134 mm diametre. There are no labels: rock and age is written on the cardboard above the photo, while locality is written below. There may be a serial number in the lower right corner.

The smaller cardboard-mounted photos are approx. 110 mm wide and 123 mm high. The photographic paper is 74×74 mm, displaying a microphoto of 72 mm diametre. Rock and age is written above, locality below. Magnification may be shown in the lower right corner (e.g. 50:1).

All original inscriptions on the boards are the handwriting of HANTKEN in black ink. The author numbered the boards on the back by pencil. The catalogue follows this numbering.

Dating the photographs

The wooden boards are covered by white paper. The backside is covered by newspaper cuts, which provides clues to the dating of the photographs. The newspaper used is the Budapesti Közlöny, an official bulletin of the City of Budapest. It is full of advertisements of company matters (meeting of the board, etc.), all bearing exact dates, consequently most cuts from the newspaper bear a date. Of course, it gives a minimum age, because the newspaper may have been used years later, than published. Most of the dates are between 1880 and 1882: and in 1883 and 1884 two papers of HANTKEN were published, which used knowledge gained from microscope studies of thin sections. Dates found on the backside of the boards are shown in the catalogue.

Origin of the rock specimens: stratigraphy and localities

Stratigraphic distribution of the photographed rock samples are shown in Table 1. Most of the localities are in present-day Hungary (Transdanubian Central Range, Mecsek, Villány Mts., while a few are in Slovakia (Western Carpathians), in Romania and Serbia (region of the Iron Gate, where the Danube crosses the Carpathians), and Italy (Euganei Hills in the foreland of the Southern Alps).

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Table 1. Stratigraphic distribution of *Hantken's* carbonate microfacies photographs preserved in the Department of Palaeontology, Eötvös University, Budapest.

Age	Small photo on wooden board	Small photo on cardboard	Large photo on wooden board	Large photo on cardboard	Total
Unknown age	–	4	–	–	4
Diluvial	1	1	1	–	3
Miocene	1	–	2	–	3
Lower Oligocene [actually Upper Eocene]	31	1	15	–	47
Eocene	17	7	6	–	30
Cretaceous	31	6	22	1	60
Jurassic	24	11	31	1	67
Triassic	6	1	7	4	18
Total					232

Tab. 2. Catalogue of microfacies photographs. The Lower Oligocene samples are now considered as of Eocene age, and arranged under the E.0000 serial numbers. Numbers above 1000 indicate small boards.

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
Triassic							
T 1	L	w	Sárgás lemezes mészkő *Yellow platy limestone*	Triasz *Triassic*	Veszprém, Jutási-völgy *Veszprém, Jutasi Valley*	1880	intrapelsparite
T 2.	L	w	Szürke mészkő *Grey Limestone*	Középső triasz *Middle Triassic*	Hajmáskér, Veszprém megye, a malom mellett *Hajmáskér, Veszprém County, at the mill*	1880	biosparite
T 3.	L	w	Sárgás tömött mészkő *Yellow compact limestone*	Felső triasz *Upper Triassic*	Veszprém (Jutasi völgy) *Veszprém (Jutasi Valley)*	1871	bioclastic packstone

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
T. 4.	L	w	Sárgás tömött mészkő *Yellow compact limestone*	Felsö triasz *Upper Triassic*	Veszprém. A vasuthoz vezető út melletti kőbánya *Veszprém. Quarry at the road to the railway*	?	intrasparite
T 5.	L	w	Dachstein mészkő *Dachstein limestone*	Rhäti képződmény *Rhaetian formation*	Dorogh Esztergommegye *Dorog, Esztergom County*	1881	Triasina grainstone-packstone
T 6.	L	w	Tömött sárgás mészkő *Compact yellow limestone*	Felsőtriasz *Upper Triassic*	Veszprém Jutási völgy *Veszprém, Jutasi Valley*	1880	bioclastic peloidal grainstone-packstone
T 7	L	c	Fehér tömött mészkő *White compact limestone*	? Dachstein *? Dachstein*	Feketehegy délnyugóti oldala Herend és Bakonybél között *Fekete Hill, SW side between Herend and Bakonybél*		oncoidic biosparite [original serial number: 262]
T 8.	L	c	Fehér tömött mészkő *White compact limestone*	Rhäti képződmény *Rhaetian formation*	Dorogh, Esztergommegye *Dorog, Esztergom County*		[original serial number: 108] an arrow shows a Triasina (name given) Triasina grainstone-packstone
T 9.	L	c	Fehér tömött mészkő *White compact limestone*	Rhäti képződmény *Rhaetian formation*	Feketehegy, Veszprémmegye *Fekete Hill, Veszprém county*		oosparite-oomicrite [original serial number: 109]
T 10.	L	c	Dachstein mészkő *Dachstein limestone*	Rhäti képződmény *Rhaetian formation*	Bakonybél, Veszprémmegye *Bakonybél, Veszprém County*		foraminifer oosparite [original serial number: 111]
T 11	L		Dachstein mészkő *Dachstein limestone*	Rhäti képződmény *Rhaetian formation*	Feketehegy Veszprémmegye *Fekete Hill, Veszprém County*	1881	microoncoidic
T 12.	L	c	Dachstein mészkő *Dachstein limestone*	Rhäti képződmény *Rhaetian formation*	Süttö (Vadas), Esztergommegye *Süttő (Vadas), Esztergom County*	1880	Triasina micrite

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
T 14.	L	c	Tömött fehér mészkő Dachsteinmész. *Compact white limestone.* *Dachstein limestone*	Rhäti *Rhaetian*	Söttő Esztergommegye *Süttő, Veszprém County*		original serial number: 261 [pencil number on backside: 6]
T 1001.	s	w	Dolomitos mészkő *Dolomitic limestone*	Középső triasz *Middle Triassic*	Hajmáskér, Veszprémmegye, az indoház átellenben a malomnál *Hajmáskér, Veszprém County, opposite the railway station, at the mill*		foraminifer biosparite
T 1002.	s	w	Sárgás tömött mészkő *Yellow compact limestone*	Felső triasz *Upper Triassic*	Veszprém, Jutási völgy *Veszprém, Jutasi Valley*		pel-packstone-grainstone
T 1003.	s	w	Sárgás tömött mészkő *Yellow compact limestone*	Felső triasz *Upper Triassic*	Veszprém, Jutási völgy *Veszprém, Jutasi Valley*		intrasparite
T 1004.	s	w	Sárgás tömött mészkő *Yellow compact limestone*	Felső triasz *Upper Triassic*	Veszprém, Jutási völgy *Veszprém, Jutasi Valley*		bioclastic pelsparite
T 1005.	s	w	Sárgás tömött mészkő *Yellow compact limestone*	Felső triasz *Upper Triassic*	Veszprém. A vasuthoz vezető ut melletti Köbánya *Veszprém. Quarry at the road to the railway*		oncosparite
T 1006.	s	w	Dachstein mészkő *Dachstein limestone*	Rhäti képződmény *Rhaetian formation*	Söttő (Vadas), Esztergommegye *Süttő (Vadas), Esztergom County*		Triasina
T 1007	s	w	Gyroporella tartalmu dolomitos mészkő *Gyroporella-bearing dolomitic limestone*		Blatnicza, Thuróczmegye *Blatnicza, Thurócz County*		Gyroporella

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
Jurassic							
J. 1	L	w	Radiolaria szarukő *Radiolarian chert*	Liasz *Liassic*	Csernye vidéke, Hársoshegy, Csernye palotai ut *Csernye region, Hársoshegy, road from csernye to Palota*	1880	
J. 2.	L	w	Vörös mészkő *Red limestone*	Alsó Liasz (Phyll. cylindricus) *Lower Liassic (Phylloceras cylindricus)*	Tata Komarommegye *Tata, Komárom County*	1880	crinoidea-bioclastic packstone
J. 3.	L	w	Sárgás tömött mészkő *Yellow compact limestone*	Alsó liasz *Lower Liassic*	Tata, Komárommegye *Tata, Komárom County*	1881	bioclastic wackestone
J. 4.	L	w	Vörös crinoid mészkő *Red crinoid limestone*	Alsó liasz *Lower Liassic*	Tata Komárommegye *Tata, Komárom County*	1881	crinoidea packstone
J. 5.	L	w	Vörös mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Tardos Komárom megye Bányahegy *Tardos, Komárom County, Bánya Hill*	1880	bioclastic packstone
J. 6.	L	w	Vörös mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Piszke, Esztergommegye Piszniczehegy *Piszke, Esztergom County, Pisznicze Hill*	1880	bioclastic packstone-wackestone
J. 7	L	w	Vöröses tömött mészkő *Red compact limestone*	Alsó liasz (Ariet. multi costatus) *Lower Liassic (Ariet. multi costatus)*	Dorogh, Esztergommegye *Dorog, Esztergom County*	1881	bioclastic wackestone
J. 8.	L	w	Radiolaria tartalmu márgás mészkő *Radiolaria-containing marly limestone*		Sz. László Baranyamegye *Szt. László, Baranya County*	1881	radiolaria mudstone-wackestone
J. 9.	L	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Urkut Veszprémmegye *Úrkút, Veszprém County*	1880	bioclastic packstone
J. 10.	L	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Urkut Veszprémmegye *Úrkút, Veszprém County*	1881	bioclastic packstone

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
J. 11	L	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Csemye vidéke, Veszprémmegye *Csemye region, Veszprém County*	1880	bioclastic packstone
J. 12.	L	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Piszke, Esztergommegye Piszniczehegy *Piszke, Esztergom County, Pisznicze Hill*	1881	bioclastic wackestone
J. 13.	L	w	Világos szürke márgamész *Light grey marly limestone*	Felső liasz *Upper Liassic*	Ajka, Veszprémmegye *Ajka, Veszprém County*	1881	bioclastic packstone
J. 14.	L	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke, Esztergommegye Pisznicehegy *Piszke, Esztergom County, Pisznicze Hill*	1880	molluscan packstone
J. 15.	L	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke, Esztergommegye Pisznicehegy *Piszke, Esztergom County, Pisznicze Hill*	1880	molluscan packstone
J. 16.	L	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke, Esztergommegye Piszniczehegy *Piszke, Esztergom County, Pisznicze Hill*	1880	molluscan packstone bioturbált
J. 17	L	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke, Esztergommegye Pisznicehegy *Piszke, Esztergom County, Pisznicze Hill*	1881	molluscan packstone
J. 18.	L	w	Vörös globigerina- és szivacstü tartalmu mészkő *Red, globigerina- and sponge spicule-bearing limestone*	Felső dogger *Upper Dogger*	Cernajka Szerbország *Cernajka, Serbia*	1881	bedded bioclastic packstone
J. 19.	L	w	Sárgás mészkő *Yellow limestone*	Középső dogger *Middle Dogger*	Ó-falu, Baranya megye *Ófalu, Baranya County*	1880	bioclastic packstone-wackestone

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
J. 20.	L	w	Vörös globigerina tartalmu mészkő *Red, Globigerina-bearing limestone*	Alsó dogger *Lower Dogger*	Olászfalu, Veszprémmegye, Eperjes hegy nyugoti alján *Olaszfalu, Veszprém County, western foot of Eperjes Hill*	1881	bioclastic packstone
J. 21	L	w	Vörös mészkő *Red limestone*	Alsó dogger *Lower Dogger*	Csernye vidéke Harsos hegy *Csernye region, Hársos Hill*	1881	bioclastic packstone
J. 22.	L	w	Vörös mészkő *Red limestone*	Középső dogger *Middle Dogger*	Piszke, Esztergomm[egye], Berseg és Bócskőhegy között *Piszke, Esztergom County, between Berseg and Bócskő Hills*	1880	bioclastic packstone [identical to J. 23]
J. 23.	L	c	Sárgás fehéres mészkő *Yellow-white limestone*	Középső dogger (Steph. Bernouilli) *Middle Dogger (Steph. Bernouilli)*	Piszke, Poczkő és Bersegh között — Esztergommegye *Piszke, between Poczkő and Berseg Hills, Esztergom County*		bioclastic packstone [identical J. 22] [original serial number: 92]
J. 24.	L	w	Világos szinű mészkő *Light-coloured limestone*	Felső dogger *Upper Dogger*	Lábatlan, Esztergommegye *Lábatlan, Esztergom County*		bioclastic wackestone
J. 25.	L	w	Microoolitos mészkő *Micro-oolitic limestone*	Felső jura *Upper Jurassic*	Villány Baranyamegye *Villány, Baranya County*		oosparite
J. 26.	L	w	Microoolithos mészkő *Micro-oolitic limestone*	Felső jura *Upper Jurassic*	Harsány Baranyamegye *Harsány, Baranya County*	1881	oosparite
J. 27	L	w	Crinoid (lithothamnium) mészkő *Crinoid (lithothamnium) limestone*	Felső jura *Upper Jurassic*	Bakonybél vidéke, Veszprémmegye, Sz.gáli erdő, Sötét árok *near Bakonybél, Veszprém County, Szentgál Forest, Sötét Gorge*	1880	crinoid bioclastic sparite

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
J. 28.	L	w	Vörös mészkő *Red limestone*	Felső jura *Upper Jurassic*	Herend vidéke Veszprémmegye Feketehegy északi oldala *near Herend, Veszprém County, northern side of Fekete Hill*	1880	bioclastic packstone
J. 29.	L	w	Crinoid (lithothamnium) mészkő *Crinoid (lithothamnium) limestone*	Felső jura *Upper Jurassic*	Csemye vidéke Hársos hegy *near Csemye, Hársos Hill*	1880	crinoid algal grainstone
J. 30.	L	w	Vörös mészkő *Red limestone*	Felső jura *Upper Jurassic*	Tardos Vasút *Tardos, railway*	1880	biomicrite
J. 31	L	w	Vörös mészkő *Red limestone*	Felső jura *Upper Jurassic*	Lábatlan Esztergommegye Berseghegy nyugoti oldala *Lábatlan, Esztergom County, western side of Berseg Hill*	1880	bioclastic packstone
J. 32.	L	c	Vörös mészkő *Red limestone*	(Hildoc. bifrons) Felső liasz *(Hildoc. bifrons) Upper Liassic*	Piszke Piszniczahegy — Esztergommegye *Piszke, Pisznice Hill, Esztergom County*		[original serial number: 14]
J. 33.	L	c	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke Piszniczahegy. Esztergommegye. *Piszke, Pisznice Hill, Esztergom County*		original serial number: 96 backside: Am[monites]. Hollandaei
J. 34.	L	c	Szivacstü tartalmu vörös mészkő *Sponge spicule-bearing red limestone*	Felső dogger *Upper Dogger*	Svinicza Szörénymegye, Új Kőbánya *Svinica, Szörény County, new quarry*	1880	molluscan packstone
J. 35.	L	w	Crinoid mészkő *Crinoid limestone*	Felső jura *Upper Jurassic*	Kerteskő, veszprémmegye, Sz. Gali erdő Sötét árok *Kerteskő, Veszprém County, Szentgál Forest, Sötét Gorge*	1881	crinoid grainstone
J. 1001.	s	w	Vörös mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Tata, Komárommegye *Tata, Komárom County*	1878	crinoid bioclastic packstone-wackestone

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			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
J. 1002.	s	w	Vörös mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Tardos Komárommegye Bányahegy *Tardos, Komárom County, Bánya Hill*		crinoid bioclastic packstone
J. 1003.	s	w	Vörös mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Piszke Esztergommegye Piszniczehegy *Piszke, Esztergom County, Pisznice Hill*	1878	bioclastic pel-packstone-wackestone
J. 1004.	s	c		Alsó liasz *Lower Liassic*	Pisznicze Nedeczkyféle kőbá[nya] *Pisznice, Nedeczky Quarry*		
J. 1005.	s	w	Fehéres mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Dorogh, Nagy Köszikla *Dorog, Nagykőszikla*		bioclastic wackestone-packstone
J. 1006.	s	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Urkut Veszprémmegye *Úrkút, Veszprém County*		foraminifer bioclastic packstone
J. 1007	s	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Urkut Veszprémmegye *Úrkút, Veszprém County*		bioclastic packstone with sponge spicules
J. 1008.	s	c	Vörös mészkő *Red limestone*		Csernye legalsó réteg *Csernye, lowermost bed*		bioclastic packstone [identical to J. 1010]
J. 1009.	s	c	Radiolaria szarukő *Radiolaria chert*		Csernye vidéke Harsoshegy *near Csernye, Hársos Hill*		
J. 1010.	s	w	Vörös mészkő *Red limestone*	Középső liasz *Middle Liassic*	Csernye vidéke Hársoshegy *near Csernye, Hársos Hill*		foraminifer crinoid packstone [identical to J. 1008]
J. 1011.	s	c	Fehér krinoidos mészkő *White crinoid limestone*	Középső liasz *Middle Liassic*	Herend Veszprémmegye Somlyó *Herend, Veszprém County, Somlyó*		crinoid foraminifer grainstone
J. 1012.	s	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke Esztergommegye Pisznicehegy *Piszke, Esztergom County, Pisznice Hill*	1878	molluscan packstone

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			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
J. 1013.	s	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke, Esztergommegye, Piszniczehegy, Konkoly féle köbánya *Piszke, Esztergom County, Pisznice Hill, Konkoly Quarry*	1878	molluscan packstone
J. 1014.	s	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke Esztergommegye Piszniczehegy *Piszke, Esztergom County, Pisznice Hill*		bioclastic molluscan packstone [label on backside: 7.]
J. 1015.	s	c	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Pisznicze *Pisznice Hill*		molluscan packstone
J. 1016.	s	w	Globigerina tartalmu vörös mészkő *Globigerina-bearing red limestone*	Felső dogger *Upper Dogger*	Cernajka Szerbország *Cernajka, Serbia*		bioclastic packstone
J. 1017	s	w	Szivacstü tartalmu vörös mészkő *Sponge spicule-bearing red limestone*	Felső dogger *Upper Dogger*	Svinicza Szörénymegye uj kőbánya *Svinica, Szörény County, new quarry*		spongiolite, packstone
J. 1018.	s	w	Sárgás mészkő *Yellow limestone*	Középső dogger *Middle Dogger*	Ó-Falu Baranyamegye *Ófalu, Baranya County*		spiculitic-bioclastic packstone [label on backside: 21.]
J. 1019.	s	w	Vöröses mészkő *Red limestone*	Alsó dogger *Lower Dogger*	Csernye vidéke Harsoshegy *near Csernye, Hársos Hill*		spiculitic bioclastic packstone
J. 1020.	s	w	Világos tömött mészkő *Light-coloured compact limestone*	Felső dogger *Upper Dogger*	Lábatlan, Esztergommegye, Berseghegy nyugoti oldalán *Lábatlan, Esztergom County, western side of Berseg Hill*		bioclastic packstone (ammonite, radiolarian)
J. 1021.	s	w	Vörös mészkő *Red limestone*	Középső dogger *Middle Dogger*	Lábatlan, esztergommegye, Berseg és Bócskőhegy között *Lábatlan, Esztergom County, between Berseg and Bócskő Hills*	1878	molluscan packstone

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
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J. 1022.	s	c	Finom szemcsés mészkő *Fine-grained limestone*	Felső jura *Upper Jurassic*	Zircz a borzavári ut melletti kőbánya *Zirc, quarry at the road to Borzavár*		foraminifer crinoid grainstone
J. 1023.	s	w	Globigerina tartalmu vörös mészkő *Globigerina-bearing red limestone*	Felső jura *Upper Jurassic*	Olaszfalu Veszprémmegye Eperjeshegy nyugoti oldala a veszprémi ut mellett *Olaszfalu, Veszprém County, western side of Eperjes Hill at the road to Veszprém*		molluscan crinoid packstone [identical to J. 1024]
J. 1024.	s	c	Vörös mészkő *Red limestone*	Felső jura *Upper Jurassic*	Olaszfalu, Veszprémmegye *Olaszfalu, Veszprém County*		molluscan crinoid packstone [identical to J. 1023]
J. 1025.	s	w	Crinoid mészkő *Crinoid limestone*	Felső jura *Upper Jurassic*	Csernye vidéke Harsoshegy *near Csernye, Hársos Hill*		crinoid grainstone
J. 1026.	s	w	Lithothamnium tartalmu crinoid mészkő *Lithothamnium-bearing crinoid limestone*	Felső jura *Upper Jurassic*	Csernye vidéke Harsoshegy *near Csernye, Hársos Hill*		crinoid algal grainstone
J. 1027	s	w	Globigerina tartalmu vörös mészkő *Globigerina-bearing red limestone*	Felső jura *Upper Jurassic*	Tardos Komárommegye, Vasút *Tardos, Komárom County, railway*		bioclastic packstone
J. 1028.	s	w	Vörös mészkő *Red limestone*	Felső jura *Upper Jurassic*	Lábatlan, Esztergommegye Bersegh nyugoti oldala *Lábatlan, esztergom County, western side of Berseg Hill*		bioclastic wackestone [identical to J. 1029]
J. 1029.	s	c	Veres mészkő *Red limestone*	Felső jura *Upper Jurassic*	Lábatlan *Lábatlan*		bioclastic wackestone [identical to J. 1028]
J. 1030.	s	w	Microoolitos mészkő *Micro-oolitic limestone*	Felső jura *Upper Jurassic*	Villány, Baranyamegye *Villány, Baranya Hill*	1880	oosparite

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J. 1031.	s	w	Lithothamnium tartalmu crinoid mészkő *Lithothamnium-bearing crinoid limestone*	Felső jura *Upper Jurassic*	Bakonybél vidéke, Veszprémmegye Sz.gali erdő, sötét árok *near Bakonybél, Veszprém County, Szentgál Forest, Sötét Gorge*		crinoid algal grainstone
J. 1032.	s	c	Crinoid mészkő *Crinoid limestone*	Felső jura *Upper Jurassic*	Bakonybél vidéke, Kerteskő *near Bakonybél, Kerteskő*		crinoid grainstone
J. 1033.	s	c	Crinoidmészkő *Crinoid limestone*		Kerteskő *Kerteskő*		crinoid grainstone
J. 1034.	s	w	Crinoid mészkő *Crinoid limestone*	Felső jura *Upper Jurassic*	Kerteskő Veszprémmegye Sz.Gáli erdő, Sötét árok *Kerteskő, Veszprém County, Szentgál Forest, Sötét Gorge*		
J. 1035.	s	w	Vörös mészkő *Red limestone*	Alsó liasz *Lower Liassic*	Tata, Komárommegye *Tata, Komárom County*	1878	foraminifer wackestone
J. 1036.	s	w	Sárgás tömött mészkő *Yellow compact limestone*	Alsó liasz *Lower Liassic*	Tata, Komárommegye *Tata, Komárom County*		foraminifer mudstone
J. 1037	s	w	Világos szürke márga mész *Light grey marly limestone*	Felső liasz *Upper Liassic*	Ajka, Veszprémmegye, Csingervölgy *Ajka, Veszprém County, Csinger Valley*		bioclastic packstone
J. 1038.	s	w	Vörös mészkő *Red limestone*	Felső liasz *Upper Liassic*	Piszke, Piszniczehegy *Piszke, Pisznice Hill*	1878	molluscan packstone
J. 1039.	s	w	Crinoid mészkő *Crinoid limestone*	Alsó liasz *Lower Liassic*	Tata, Komárommegye *Tata, Komárom County*		crinoid packstone
Cretaceous							
K. 1	L	w	Foraminiferamészkő Caprotinamészkő (Miliolidea, textulariak, et) *Foraminifer limestone, Caprotina limestone (Miliolidea, textularias, etc.)*		Bakonybél vidéke, Bakonybél herendi ut a kokutnal Feketehegy *near Bakonybél, along the Bakonybél–Herend road, at the stone-walled well*	1881	bioclastic packstone-grainstone

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K. 2.	L	w	Szürke tömött foraminifera mészkő *Grey, compact foraminifer limestone*	Alsó kréta *Lower Cretaceous*	Beremend Baranyamegye Alsó köbánya *Beremend, Baranya County, lower quarry*	1880	bioclastic packstone
K. 3.	L	w	Szürke tömött mészkő *Grey, compact limestone*	Alsó kréta *Lower Cretaceous*	Beremend Baranyamegye Alsó köbánya *Beremend, Baranya County, lower quarry*	1880	bioclastic packstone
K. 4.	L	w	Szürke tömött foraminifera mészkő (Miliolidea, Textularidea, Orbitulina) *Grey, compact foraminifer limestone (Miliolidea, Textularidea, Orbitulina)*	Alsó kréta *Lower Cretaceous*	Beremend Barányamegye Alsó köbánya *Beremend, Baranya County, lower quarry*	1880	bioclastic grainstone
K. 5.	L	w	Szürke tömött foraminifera mészkő (Miliolidea, Textularidea, Orbitulina) *Grey, compact foraminifer limestone (Miliolidea, Textularidea, Orbitulina)*	Alsó kréta *Lower Cretaceous*	Beremend Barányamegye Alsó köbánya *Beremend, Baranya County, lower quarry*	1880	bioclastic grainstone
K. 6.	L	w	Szürke tömött foraminifera mészkő (Miliolidea, textulariák, orbitulinák...) *Grey compact foraminifer limestone (Miliolidea, textularias, orbitulinas...)*	Alsó kréta *Lower Cretaceous*	Harsány, Barányamegye Hársányhegy *Harsány, Baranya County, Harsány Hill*	1880	bioclastic grainstone
K. 7	L	w	Tömött mészkő. Caprotina mész *Compact limestone.* *Caprotina limestone*	Neocom *Neocomian*	Ó bánya Veszprémmegye *Óbánya, Veszprém County*	1881	bioclastic intra-grainstone
K. 8.	L	w	Szürke finom szemcsés mészkő (Lithothamnium) *Grey, fine-grained limestone (Lithothamnium)*	Alsó neocom *Lower Neocomian*	Puszta Alsó-Pere (Veszprém.) *Puszta Alsó-Pere (Veszprém County)*	1880	bioclastic grainstone

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K. 9.	L	w	Foraminifera mészkő *Foraminifer limestone*	Neocom *Neocomian*	Puszta Csősz Veszprémmegye Csikling vár *Puszta Csősz, Veszprém County, Csikling fortress*	1881	bioclastic grainstone
K. 10.	L	w	Foraminifera mészkő Caprotina mészkő *Foraminifer limestone. Caprotina limestone*	Neocom *Neocomian*	Puszta Csősz Veszprémmegye Csikling vár *Puszta Csősz, Veszprém County, Csikling fortress*	1880	bioclastic grainstone
K. 11	L	c	Rudista mészkő (Orbitulina) *Rudist limestone (Orbitulina)*	Alsó kréta *Lower Cretaceous*	Pénzeskut Veszprémmegye *Pénzeskút, Veszprém County*		bioclastic grainstone [original serial number: 61]
K. 12.	L	w	Foraminifera mészkő *Foraminifer limestone*	Alsó kréta *Lower Cretaceous*	Pénzeskut Veszprémmegye *Pénzeskút, Veszprém County*	1880	bioclastic packstone
K. 13.	L	w	Szürke charatartalmu agyag *Grey chara-bearing clay*	Alsó kréta *Lower Cretaceous*	Bakonybél vidéke Sz. gáli erdő Pipaföldárok, az átvágástól felfelé *near Bakonybél, Szentgál Forest, Pipaföld valley, upwards from the cut*	1881	bioclastic packstone
K. 14.	L	w	Orbitulina mészkő (Caprotina mészkő) *Orbitulina limestone (Caprotina limestone)*	Alsó kréta *Lower Cretaceous*	Pénzeskut Veszprémmegye *Pénzeskút, Veszprém County*	1880	bioclastic grainstone
K. 15.	L	w	Homokos sárga mészkő *Sandy yellow limestone*	Középső kréta *Middle Cretaceous*	Alsó Lyubkova Szörény megye, a Duna partján *Alsó Lyubkova, Szörény County, along the Danube river*	1881	bioclastic packstone-wackestone
K. 16.	L	w	Homokos sárgás lithothamnium mészkő *Sandy yellow lithothamnium limestone*	Középső kréta *Middle Cretaceous*	Alsó (Dolnya) Lyubkova Szörénymegye, a Duna partján *Alsó (Dolnya) Lyubkova, Szörény County, along the Danube river*	1880	bioclastic grainstone
K. 17	L	w	Szürke szemcsés mészkő *Grey, coarse-grained limestone*	Középső kréta *Middle Cretaceous*	Jásd, Veszprémmegye, Doboshegy *Jásd, Veszprém County, Dobos Hill*	1881	bioclastic grainstone

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K. 18.	L	w	Szemcsés mészkő *Coarse-grained limestone*	Gault *Gault*	Sz. Gaal, Veszprémmegye, Feketehegy déli oldala *Szentgál, Veszprém County, southern side of Fekete Hill*	1881	bioclastic grainstone
K. 19.	L	w	Glauconitos mészkő *Glauconitic limestone*	Gault *Gault*	Akli puszta Veszprémmegye *Akli puszta, Veszprém County*	1880	bioclastic packstone-grainstone
K. 20.	L	w	Finom szemcsés világos szürke mészkő *Fine-grained light grey limestone*	Középső kréta *Middle Cretaceous*	Feketehegy Veszprémmegye keleti oldala *eastern side of Fekete Hill, Veszprém County*	1881	bioclastic grainstone
K. 21	L	w	Rudista (Caprotina) mészkő *Rudist (Caprotina) limestone*	Also Kréta *Lower Cretaceous*	Kis Tóthfalu Baranyamegye Török potja. *Kis Tóthfaly, Baranya County, Török potja*	1880	bioclastic packstone
K. 22.	L	c	Szürke tömött mészkő *Grey compact limestone*	Alsó neocom *Lower Neocomian*	Radola Trencsénmegye *Radola, Trencsén County*		original serial number: 74 pencil mark on backside: 5
K. 23.	L	w	Rudista (Caprotina) mészkő *Rudist (Caprotina) limestone*	Alsó Kréta *Lower Cretaceous*	Ó Bánya, Veszprémmegye, Gyergyankuti ut *Óbánya, Veszprém County, Gyertyánkút Road*	1880	bioclastic packstone
K. 24.	L	w	Szürke tömött mészkő *Grey compact limestone*	Alsó neocom *Lower Neocomian*	Radola, Trencsinmegye *Radola, Trencsén County*		hardly readable notes on the locality on backside
K. 25.	L	w	Szürke tömött foraminifera mészkő (Miliolidea, Textilariák és Orbitulinák) *Grey compact foraminifer rlimestone (Miliolidea, Textularias and Orbitulinas)*	Alsó Kréta *Lower Cretaceous*	Beremend, Baranyamegye, Középső Kőbánya *Beremend, Baranya County, middle quarry*	1881	foraminifer packstone
K. 1001.	s	w	Globigerina és Orbitoid tartalmu mészmárga *Globigerina- and Orbitoid-bearing calcareous marl*		Porva, Veszprémmegye *Porva, Veszprém County*		bioclastic grainstone

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K. 1002.	s	w	Orbitulina foraminifera mészkőből (Caprotina mész) *Orbitulina foraminifer from limestone (Caprotina limestone)*		Pénzeskút Veszprémmegye *Pénzeskút, Veszprém County*		bioclastic grainstone
K. 1003.	s	c	Orbitoid mészkő *Orbitoid limestone*		Porva *Porva*		bioclastic grainstone
K. 1004.	s	w	Szürke tömött mészkő *Grey compact limestone*	Alsó neocom *Lower Neocomian*	Svinicza *Svinica*		bioclastic packstone
K. 1005.	s	w	Szürke tömött mészkő *Grey compact limestone*	Alsó neocom *Lower Neocomian*	Svinicza Szörénymegye *Svinica, Szörény County*		bioclastic packstone
K. 1006.	s	w	Caprotina mészkő *Caprotina limestone*	Alsó kréta *Lower Cretaceous*	Kis Tóthfalu Baranyamegye Törökpontja *Kis Tóthfalu, Baranya County, Törökpontja*	1880	bioclastic packstone
K. 1007	s	w	Orbitulina a szürke tömött foraminifera mészkőből *Orbitulina from the grey compact foraminifer limestone*	Alsó kréta *Lower Cretaceous*	Beremend Középső köbánya *Beremend, middle quarry*		
K. 1008.	s	w	Szürke tömött foraminifera mészkő *Grey compact foraminifer limestone*	Alsó kréta *Lower Cretaceous*	Beremend Baranyamegye *Beremend, Baranya County*		bioclastic pel-grainstone
K. 1009.	s	w	Szürke tömött foraminifera mészkő *Grey compact foraminifer limestone*	Alsó Kréta *Lower Cretaceous*	Beremend Baranyamegye Alsó köbánya *Beremend, Baranya County, lower quarry*		foraminifer grainstone
K. 1010.	s	w	Foraminifera tartalmu szürke tömött mészkő (Miliolidea, Textularia és Orbitulina) *Foraminifer-bearing grey compact limestone (Miliolidea, Textularia and Orbitulina)*	Alsó kréta *Lower Cretaceous*	Beremend Baranyamegye, Alsó köbánya *Beremend, Baranya County, lower quarry*		foraminifer wackestone

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K. 1011.	s	w	Orbitulina mészkő *Orbitulina limestone*	Alsó kréta *Lower Cretaceous*	Harsány, Baranyamegye *Harsány, Baranya County*	1880	bioclastic packstone
K. 1012.	s	w	Foraminifera mészkő Caprotina mészkő *Foraminifer limestone Caprotina limestone*	Alsó kréta *Lower Cretaceous*	Harsány, baranyamegye *Harsány, Baranya County*		foraminifer intra-grainstone
K. 1013.	s	w	Caprotina mészkő *Caprotina limestone*	Alsó kréta *Lower Cretaceous*	Gyertyankut, Veszprémmegye *Gyertyánkút, Veszprémmegye*	1880	bioclastic packstone
K. 1014.	s	w	Munieria mészkő *Munieria limestone*	Alsó kréta *Lower Cretaceous*	Zircz, Veszprémmegye, Fenyvesnél *Zirc, Veszprém County, at the pine forest*	1878	bioclastic packstone
K. 1015.	s	w	Foraminifera mészkő (Caprotina mészkő) *Foraminifera limestone (Caprotina limestone)*	Alsó kréta *Lower Cretaceous*	Bakonybél vidéke, Veszprém-megye, Feketehegy, Kőkut, Herend-Bakonybéli uton *near Bakonybél, Veszprém County, Fekete Hill, Kőkút, Herend–Bakonybél road*		bioclastic grainstone nagyon halvány kép
K. 1016.	s	w	Szürke finom szemcsés mészkő (Lithothamnium) *Grey fine-grained limestone (Lithothamnium)*	Felső neocom *Upper Neocomian*	Puszta Alsó pere, Veszprémmegye *Puszta Alsó pere, Veszprém County*		intra-bioclastic grainstone
K. 1017	s	w	Caprotina mészkő	Alsó kréta *Lower Cretaceous*	Ó bánya, Veszprémmegye *Óbánya, Veszprém County*		foraminifer grainstone
K. 1018.	s	w	Caprotina mészkő *Caprotina limestone*	Alsó kréta *Lower Cretaceous*	Puszta Csősz, Veszprémmegye, Csiklingvár *Puszta Csősz, Veszprém County, Csikling fortress*		bioclastic grainstone halvány kép
K. 1019.	s	w	Fehér tömött mészkő *White compact limestone*	Alsó kréta *Lower Cretaceous*	Puszta Csősz, Veszprémmegye, Csikling vár *Puszta Csősz, Veszprém County, Csikling fortress*		foraminifer grainstone halvány kép

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K. 1020.	s	w	Fehér tömött mészkő *White compact limestone*	Alsó kréta *Lower Cretaceous*	Bakony, Veszprémmegye, Feketehegy, Sz. gali erdő *Bakony, Veszprém County, Fekete Hill, Szentgál Forest*		
K. 1021	s	w	Orbitulina foraminifera mészkőből (Caprotina mész) *Orbitulina from foraminifer limestone (Caprotina limestone)*	Alsó kréta *Lower Cretaceous*	Penczeskut, Gerenczevölgy *Pénzeskút, Gerence Valley*		Orbitolina in bioclastic packstone
K. 1023.	s	w	Orbitulina mészkő *Orbitulina limestone*	Alsó kréta *Lower Cretaceous*	Penzeskút, Veszprémmegye, Gerencze völgy *Pénzeskút, Veszprém County, Gerence Valley*	1880	foraminifer grainstone
K. 1030.	s	c	Crinoidos mészkő *Crinoid limestone*		Tata *Tata*		crinoid packstone [identical to J. 1039]
K. 1031.	s	w	Lithothamnium Rudista mészkőben *Lithothamnium in rudist limestone*		Kis Tóthfalu, Baranyamegye, Siklósi hegység, Török pótja... *Kis Tóthfalu, Baranya County, Siklós Hills, Török pótja*	1880	
K. 1032.	s	c	? Scaglia Globigerinák *? Scaglia Globigerinas*	? Felsõ-kréta *? Upper Cretaceous*	Val di Sotto (Euganei hegység) Olaszország *Val di Sotto (Euganei Hills), Italy* 50:1 (130,2)		globigerina-packstone
K. 1033.	s	c	? Scaglia Globigerinák 100:1 *? Scaglia Globigerinas 100:1*	? felsõ-kréta *? Upper Cretaceous*	Val di Sotto (Euganei hegység) Olaszország (130,2) *Val di Sotto, Euganei Hills, Italy*		globigerina packstone
K. 1034.	s	p	Scaglia Rotalideák *Scaglia Rotalideas*	Felsõ-kréta *Upper Cretaceous*	Kozo v. Lozo (Euganei hegység) Olaszország 50:1 (108/2) *Kozo or Lozo (Euganei Hills), Italy*		Globorotalia packstone

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K. 1035.	s	w	Orbitulina a szürke tömött foraminifera mészkőből *Orbitulina from the grey compact foraminifer limestone*	Alsó kréta *Lower Cretaceous*	Beremend, Alsó Kőbánya *Beremend, lower quarry*		Orbitolina
K. 1036.	s	w	Lithothamnium tartalmu sárgás homokos mészkő *Lithothamnium-bearing yellow sandy limestone*	Középső kréta *Middle Cretaceous*	Alsó (Dolnja) Lyubkova, Szörénymegye, a Duna partján *Alsó (Dolnja) Lyubkova, Szörény County, at the river Danube*		algal grainstone
K. 1037	s	w	Sárgás-barnás mészkő *Yellowish-brown limestone*	Alsó-kréta *Lower Cretaceous*	Ali Beg és Coronini között (az Al-Duna vidéke) 35. f. sz. 50:1 *between Ali Beg and Coronini (at the Danube Gorges)*		foraminifer grainstone
K. 1038.	s	w	Sárgás márga meszkő *Yellow marly limestone*	Alsó kréta *Lower Cretaceous*	Bakonybel vidéke, Szt. Gaali erdő, Pipaföldarok *near Bakonybél, Szentgál Forest, Pipaföld Valley*	1874	foraminifer grainstone
Eocene							
E. 1	L	w	Fehér mészkő *White limestone*	Eocen. Num Lucasana szint *Eocene. Num. Lucasana horizon*	Blatnicza, Thurocz megye *Blatnicza, Thurocz County*	1880	ech-algal grainstone
E. 2.	L	w	Finom szemcsés mészkő *Fine-grained limestone*	Eocen. *Eocene*	Ajka Veszprémmegye — Gépokna 8 ölnyi mélységben *Ajka, Veszprém County, Machine shaft, from 8 fathom depth*	1881	sandy limestone
E. 3.	L	w	Miliolidea (Cymopolia) mészkő. *Miliolidea (Cymopolia) limestone*	Középső Eocen. *Middle Eocene*	Urkut. Veszprémmegye, Külső láz *Úrkút, Veszprém County, Külső Láz*	1880	dasycladacean limestone

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E. 4.	L	w	Miliolidea (Cymopolia) mészkő *Miliolidea (Cymopolia) limestone*	Eocen. *Eocene*	Urkut Veszprémmegye, Külső laz *Úrkút, Veszprém County, Külső Láz*	1880	dasycladacean limestone
E. 5.	L	w	Budai márga Bryozoa foraminifera, szivácstüske lithothamnium. *Buda marl* *Bryozoa, foraminifera, sponge spicule, lithothamnium*		Buda Kis Svábhegy teteje *Buda, top of Kis Sváb Hill*	1880	algal foraminifer packstone
E. 6.	L	w	Budai márga Bryozoa foraminifera Lithotamnium et. *Buda marl* *Bryozoa, foraminifera, Lithotamnium, etc.*		Buda Kis Svábhegy északi oldala középső kőbánya *Buda, northern side of Kis Sváb Hill, middle quarry*	1880	bioclastic packstone
E. 7	L	w	Budai márga (Bryozoamárga) Bryozoa foraminifera lythothamnium *Buda marl (Bryozoan marl)* *Bryozoa, foraminifera, Lithothamnium*		Buda Jozsefhegy keleti lejtője, Dr. Dobay féle nyaraló mellett. *Buda, eastern slope of József Hill, at the house of Dr. Dobay*	1880	bryozoan packstone
E. 8.	L	w	Globigerina és Orbitoid tartalmu mészkő *Globigerina- and orbitoid-bearing limestone*	Alsó oligocen *Lower Oligocene*	Porva Veszprémmegye *Porva, Veszprém County*	1881	globigerinacean bioclastic packstone
E. 9.	L	w	Bryozoa foraminifera (lythothamnium mészkő) *Bryozoa foraminifera (Lithothamnium limestone)*	Alsó oligocen *Lower Oligocene*	Buda Kis Svábhegy északi oldala Középső kőbánya a Budai márga alatt *Buda, northern side of Kis Sváb Hill, middle quarry, below the Buda marl*	1880	bioclastic packstone

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E. 10.	L	w	Lithothamnium mészkő *Lithothamnium limestone*	Alsó oligocen *Lower Oligocene*	Buda Szépvölgy, Budai márga-ba betelepülve *Buda, Szép Valley, in Buda Marl*	1881	algal grainstone
E. 11	L	w	Bryozoa foraminifera Lithothamnium mészkő. *Bryozoa foraminifera Lithothamnium limestone*	Alsó oligocen *Lower Oligocene*	Buda Fogaskereki vasut I^{sö} állomása *Buda, Cogwheel Railway, first stop*	1880	bioclastic grainstone
E. 12.	L	w	Orbitoid márga *Orbitoid marl*	Alsó oligocen *Lower Oligocene*	Porva, Veszprémmegye *Porva, veszprém County*	1881	bioclastic packstone
E. 13.	L	w	Lithothamnium mészkő *Lithothamnium limestone*	Alsó oligocen *Lower Oligocene*	Buda, Szép völgy — Utolsó köbánya *Buda, Szép Valley, last quarry*	1880	algal packstone
E. 14.	L	w	Lithothamnium mészkő *Lithothamnium limestone*	Alsó oligocen *Lower Oligocene*	Nagy Kovácsi, Pestmegye *Nagykovácsi, Pest County*	1880	algal grainstone
E. 15.	L	w	Orbitoid és globigerina tartalmu mészkő *Orbitoid- and globigerina-bearing limestone*	Alsó oligocen *Lower Oligocene*	Porva, veszprémmegye *Porva, Veszprém County*	1881	bioclastic packstone
E. 16.	L	w	Foraminifera mészkő tályagba betelepülve *Foraminifer limestone embedded in clay*	Alsó oligocen *Lower Oligocene*	Blatnicza, Thúroczmegye, a vár közelében *Blatnicza, Thurócz County, at the castle*	1881	foraminifer grainstone
E. 17	L	w	Orbitoid mészkő *Orbitoid limestone*	Alsó oligocen *Lower Oligocene*	Üröm, Pestmegye *Üröm, Pest County*	1880	Discocyclina packstone
E. 18.	L	w	Nummulites spira tartalmu mészkő *Nummulites spira-bearing limestone*	Eocen *Eocene*	Ajka, Veszprémmegye *Ajka, Veszprém County*	1881	bioclastic packstone
E. 19.	L	w	Bryozoa foraminifera Lithothamnium mészkő *Bryozoa foraminifera Lithothamnium limestone*	Alsó oligocen *Lower Oligocene*	Buda, Szépvölgy *Buda, Szép Valley*	1880	bioclastic packstone

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E. 20.	L	w	Nummulites spira tartalmu mészkő *Nummulites spira-bearing limestone*	Eocén *Eocene*	Ajka, Veszprémmegye *Ajka, Veszprém County*	1881	algal foraminifer grainstone
E. 1001	s	w	Fehér tömött mészkő *White compact limestone*	Eocen *Eocene*	Blatnicza Thurocz megye *Blatnicza, Thurocz County*		foraminifer packstone
E. 1002.	s	w	Miliolidea márgamész *Miliolidea marly limestone*	Eocen. *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*	1880	coral or sponge packstone
E. 1003.	s	w	Miliolidea mészmárga *Miliolidea calcareous marl*	Eocen. *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*		pencil mark on backside: szivacsok *sponges*
E. 1004.	s	w	Mylitus mészkő *Mylitus limestone*	Eocen *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*		bivalvia-packstone
E. 1005.	s	w	Szemecses mészkő *Coarse-grained limestone*	Eocen *Eocene*	Ajka, Veszprémmegye, Gépakna *Ajka, Veszprém County, Machine Shaft*		sandy bioclastic packstone
E. 1006.	s	w	Mylitus mészkő *Mylitus limestone*	Eocen *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*		bivalve-packstone
E. 1007	s	w	Mylitus mészkő *Mylitus limestone*	Eocen *Eocene*	Budakesz, Pest megye *Budakeszi, Pest County*	1880	bivalve-packstone
E. 1008.	s	w	Mylitus mészkő *Mylitus limestone*	Eocen *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*		molluscan bryozoan packstone
E. 1009.	s	w	Miliolidea márgás mészkő *Miliolidea marly limestone*	Eocen *Eocene*	Urkut Veszprémmegye, Külső láz *Úrkút, Veszprém County, Külső Láz*		foraminifer packstone
E. 1010.	s	w	Miliolidea márga *Miliolidea marl*	Eocen *Eocene*	Urkut Veszprémmegye, Külső láz *Úrkút, Veszprém County, Külső Láz*		bioclastic packstone
E. 1011.	s	w	Numulites spira mészkő (Lithothamnium) *Nummulites spira limestone (Lithothamnium)*	Eocen *Eocene*	Ajka, Veszprémmegye *Ajka, Veszprém County*		algal foraminifer packstone

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E. 1012.	s	w	Miliolidea mészmárga *Miliolidea calcareous marl*	Eocen *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*		korallos
E. 1013.	s	c	Num. Lucasana tartalmu mészkő (Alveolina) *Num. Lucasana-bearing limestone (Alveolina)*	Eocen *Eocene*	Ajka, veszprémmegye *Ajka, Veszprém County*		Alveolina
E. 1014.	s	c	Fehér finom szemcsü mészkő *White fine-grained limestone*	Eocen *Eocene*	Ajka, Veszprémmegye Lég akna *Ajka, Veszprém County, Windshaft*		foraminifer bryozoan packstone
E. 1015.	s	c	Finom szemcsés mészkő *Fine-grained limestone*	Eocen *Eocene*	Ajka *Ajka*		sandy foraminifer packstone
E. 1016.	s	c	Miliolidea mészkő *Miliolidea limestone*	Eocen *Eocene*	Blatnicza, Thuroczmegye *Blatnicza, Thurócz County*		pencil mark on backside: 4.
E. 1017	s	w	Lithothamnium mészkő *Lithothamnium limestone*	Alsó oligocén *Lower Oligocene*	Blatnicza, Thurocz megye *Blatnicza, Thurócz County*		algal foraminifer grainstone
E. 1018.	s	w	Orbitoid mészkő vonalozott numilitokkal *Orbitoid limestone with lineated Nummulites*	Alsó oligocén *Lower Oligocene*	Puszta Domonkos Domonkoshegy, a N. Tchihatchefi mészkő felett *Puszta Domonkos, Domonkos Hill, above the N. Tchihatcheffi limestone*		Discocyclina limestone
E. 1019.	s	c			Nagykovácsi *Nagykovácsi*		Discocyclina limestone
E. 1020.	s	w	Lithothamnium tartalmu mészkő *Lithothamnium-bearing limestone*	Alsó oligocén *Lower Oligocene*	Nagy Kovácsi, Pestmegye *Nagykovácsi, Pest County*	1880	algal grainstone
E. 1021	s	c	Orbitoid és globigerina tartalmu márgamész *Orbitoid- and globigerina-bearing marly limestone*	Alsó oligocén *Lower Oligocene*	Porva, Veszprémmegye *Porva, Veszprém County*		globigerinacean bryozoan packstone
E. 1022.	s	w	Orbitoid mészmárga *Orbitoid calcareous marl*	Alsó oligocén *Lower Oligocene*	Porva, Veszprémmegye *Porva, Veszprém County*		Discocyclina grainstone

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E. 1023.	s	c	Orbitoid márga mész (Schirophora haeringensis) *Orbitoid marly limestone (Schirophora haeringensis)*	Alsó oligocén *Lower Oligocene*	Porva, veszprémmegye *Porva, Veszprém County*		Discocyclina packstone
E. 1024.	s	w	Orbitoid mészkő *Orbitoid limestone*	Alsó oligocén *Lower Oligocene*	Ürüm, Pestmegye *Ürüm, Pest County*		bryozoan globigerinacean packstone
E. 1025.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy teteje *Buda, top of Kis Sváb Hill*	1880	bioclastic packstone
E. 1026.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy északi oldala Középső kőbánya a szemcsés mészkő felett *Buda, northern side of Kis Sváb Hill, middle quarry, above the coarse-grained limestone*	1880	bioclastic packstone
E. 1027.	s	w	Lithothamnium mészkő (Orbitoid mészkő alatt) *Lithothamnium limestone (below orbitoid limestone)*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy, utolsó kőbánya *Buda, Szép Valley, last quarry*		algal packstone
E. 1028.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy alja Balassa féle szőllő melletti árok *Buda, foot of Kis Sváb Hill, trench at Balassa vineyard*		foraminifer
E. 1029.	s	w	Budai márga Buda marl	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy teteje, délkeleti kőbánya *Buda, Kis Sváb Hill, SE quarry*		bioclastic packstone
E. 1030.	s	w	Bryozoa & Lithothamnium mészkő a Budai márgában *Bryozoa & Lithothamnium limestone in Buda Marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy alja *Buda, foot of Kis Sváb Hill*		algal packstone backside: Balassi féle szöllő mellett *at the Balassi vineyard*

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E. 1031	s	w	Budai márga (Bryozoa márga) *Buda marl (Bryozoa marl)*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy, Főárok *Buda, Szép Valley, Great Valley*	1878	bioclastic packstone
E. 1032.	s	w	Lithothamnium mészkő (Orbitoid mészkő alatt) *Lithothamnium limestone (below orbitoid limestone)*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy, utolsó köbánya *Buda, Szépvölgy, last quarry*		algal packstone
E. 1033.	s	w	Numulit mészkő N. intermedia, N. fichteli *Nummulit limestone N. intermedia, N. fichteli*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy északi oldala, Felső köbánya az orbitoid mészkő alatt *Buda, northern side of Kis Sváb Hill, upper quarry, below the orbitoid limestone*		Nummulites in crinoid packstone
E. 1034.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Kis Svábhegy alja, Balassa féle szőllő melleti árok *for of Kis Sváb Hill, trench at the Balassa vineyard*		marl
E. 1035.	s	w	Szemcsés mészkő *Coarse-grained limestone*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy északi oldala Középső köbánya a conglomerat felett *Buda, Kis Sváb Hill, northern side. Middle quarry, above the conglomerate*		foraminifer packstone
E. 1036.	s	w	Lithothamnium mészkő (Budai márgában) *Lithothamnium limestone (in Buda marl)*	Alsó oligocén *Lower Oligocene*	Buda, A Temető mellett Fáczánhoz vezető út *Buda, road to the Fáczán, at the cemetery*		backside: Kis Svábh. és Laszlovszky hegy közetti völgy *valley between Kis Sváb Hill and Laszlovszky Hill*
E. 1037	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy, Főárok *Buda, Szép Valley, Great Valley*	1879	bryozoan packstone hátoldalon: Budai márga (bryozoamárga)

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
E. 1038.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy teteje *Buda, top of Kis Sváb Hill*	1880	bioclastic packstone
E. 1039.	s	w	Orbitoid mészkő *Orbitoid limestone*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy *Buda, Szép Valley*		Discocyclina-packstone hátoldalon: Kis Svábhegy északi oldalból
E. 1040.	s	w	Orbitoid mészkő *Orbitoid limestone*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy *Buda, Kis Sváb Hill*		Discocyclina-packstone backside: Szépvölgy, nagy kőbánya *Szép Valley, large quarry*
E. 1041.	s	w	Bryozoa mészkő *Bryozoa limestone*	Alsó oligocén *Lower Oligocene*	Buda, Zúgliget, a Fáczánhoz vezető út *Buda, Zugliget, road to the Fáczán*	1880	bioclastic packstone
E. 1042.	s	w	Bryozoa mészkő *Bryozoa limestone*	Alsó oligocén *Lower Oligocene*	Buda, Zúgliget, a Fáczánhoz vezető út *Buda, Zugliget, road to the Fáczán*		bioclastic packstone
E. 1043.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Pestmegye, Szépvölgy, Föárok *Buda, Szép Valley, road to the Fáczán*	1878	bioclastic packstone
E. 1044.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy teteje *Buda, top of Kis Sváb Hill*	1878	bioclastic packstone
E. 1045.	s	w	Budai márga *Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy teteje, délkeleti kőbánya *Buda, top of Kis Sváb Hill, SE quarry*	1878	bioclastic packstone
E. 1046.	s	w	Bryozoa mészkő, Budai márgában *Bryozoa limestone in Buda marl*	Alsó oligocén *Lower Oligocene*	Buda, A temető mellett Fáczánhoz vezető út Buda, road to the Fáczán, at the cemetery	1881	bioclastic packstone

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
E. 1047	s	w	Numulitmészkő Num. intermedia, N. Fichteli *Nummulites limestone Num. intermedia, N. Fichteli*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy Felső Köbánya *Buda, Kis Sváb Hill, upper quarry*		backside: Kis Svábhegy északi oldal orbitoid mészkő alatt N. intermedia *Kis Sváb Hill, northern side, below the orbitoid limestone, N. intermedia*
E. 1048.	s	w	Foraminifera mészkő *Foraminifer limestone*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy *Buda, Szép Valley*	1880	
E. 1049.	s	w	Numulitmészkő Num. Fichteli, N. Tournoueri *Nummulites limestone Num. Fichteli, N. Tournoueri*	Alsó oligocén *Lower Oligocene*	Buda, Kis Svábhegy, Felső Köbánya *Buda, Kis Sváb Hill, upper quarry*		backside: Kis Svábhegy északi oldal, orbitoid mészkő alatt N. Fichteli és ... *Kis Sváb Hill, northern side, below orbitoid limestone, N. Fichteli and...*
E. 1050.	s	w	Lithothamnium mészkő *Lithothamnium limestone*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy *Buda, Szép Valley*		
E. 1051.	s	w	Lithothamnium mészkő *Lithothamnium limestone*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy *Buda, Szép Valley*		algal foraminifer packstone
E. 1052.	s	w	Orbitoid mészkő *Orbitoid limestone*	Alsó oligocén *Lower Oligocene*	Buda, Szépvölgy *Buda, Szép Valley*		Discocyclina-packstone backside: Szépvölgy, nagy köbánya *Szép Valley, large quarry*
E. 1053.	s	w	Mészalga az örvös sifoneák családjából, Eocen mészkőből *Calcareous alga from the family of verticillate Siphoneae, from Eocene limestone*	Eocén *Eocene*	Budakesz, Pestmegye *Budakeszi, Pest County*	1878	bioclastic packstone with dasycladacean s

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E. 1054.	s	w	Alveolina *Alveolina*	Eocén *Eocene*	Ajka, Veszprémmegye *Ajka, Veszprém County*		Alveolina
E. 1055.	s	w	Miliolidea és cymopolia márga *Miliolidea and Cymopolia marl*	Eocén *Eocene*	Urkut, Veszprémmegye Külső láz *Úrkút, Veszprém County, Külső Láz*		dasycladacean foraminifer grainstone
E. 1056.	k	w	Lithothamnium mészkő *Lithothamnium limestone*		Tokod, Esztergommegye *Tokod, Esztergom County*		algal packstone
Miocene							
M. 1	L	w	Miliolidea mészkö *Miliolidea limestone*	Miocen Szarmata emelet *Miocene, Sarmatian stage*	Pécs, Baranyamegye *Pécs, Baranya County*	1872	foraminifer grainstone
M. 2.	s	w	Miliolidea mészkő *Miliolidea limestone*	Miocen, Szarmata emelet *Miocene Sarmatian stage*	Pécs, Baranyamegye *Pécs, Baranya County*		foraminifer grainstone
M. 3.	L	w	Lithothamnium és Amphistegina tartalmu mészkő (Lajtamész) *Lithothamnium- and Amphistegina-bearing limestone (Leitha limestone)*		Szobb, Hontmegye *Szob, Hont County*	1880	algal foraminifer grainstone
Quaternary							
Q. 1	L	w	Chara tartalmu édesvizi mészkő. *Chara-bearing freshwater limestone*	Diluvial *Diluvial*	Lábatlan Bocskő. *Lábatlan, Bocskő*	1880	bioclastic packstone
Q. 1001	s	w	Chara tartalmu édes vízi mészkő *Chara-bearing freshwater limestone*	Diluvial *Diluvial*	Piszke Esztergommegye Boczkő *Piszke, Esztergom County, Boczkő*		Chara

Serial number	L/s	w/c	Labels in Hungarian *English translation of label text*			D	Remarks
			Rock type	Age	Locality		
L/s = Large or small board, w/c = wooden board or cardboard D = date on the newspaper cut covering the backside							
Q. 1002.	s	w	Édesvízi mészkő Chara *Freshwater limestone* *Chara*		Lábatlan, Esztergommegye *Lábatlan, Esztergom* *County*	1878	bioclastic packstone
Q. 1003.	s	c	Édesvizi mészkő *Freshwater limestone*	Diluvial *Diluvial*	Lábatlan, Esztergommegye *Lábatlan, esztergom* *County*		number on backside: 7

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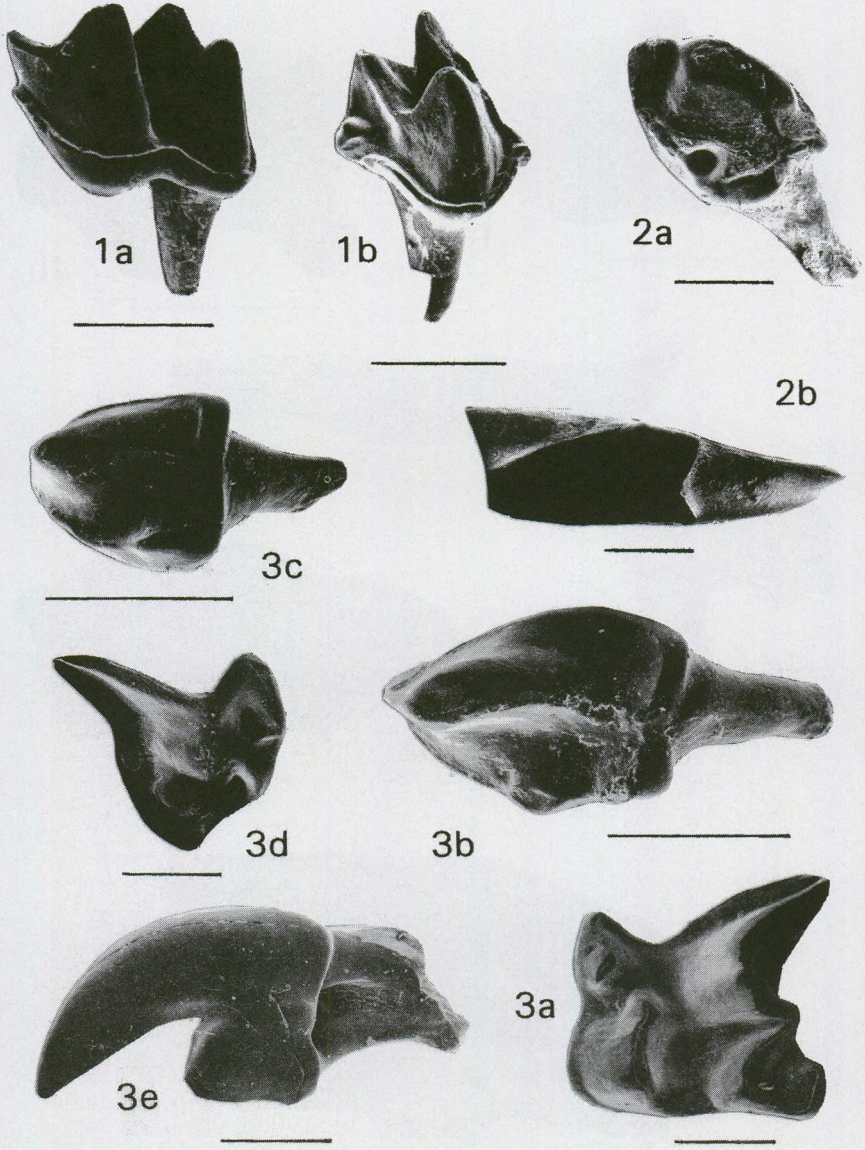
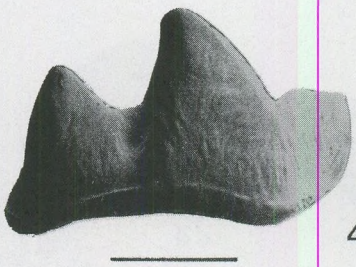


Plate 2



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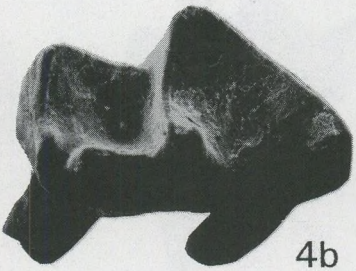

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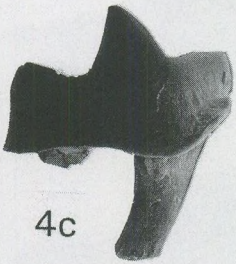

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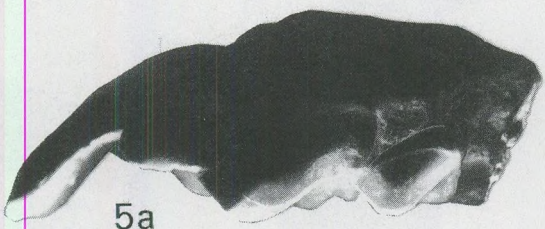

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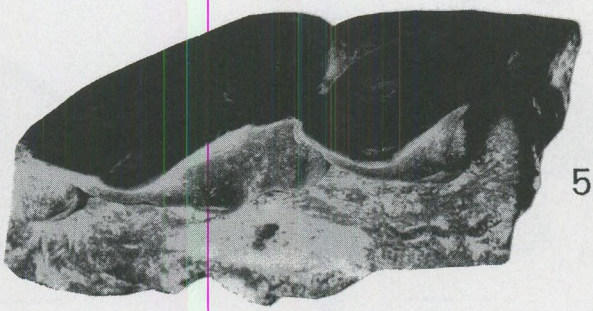

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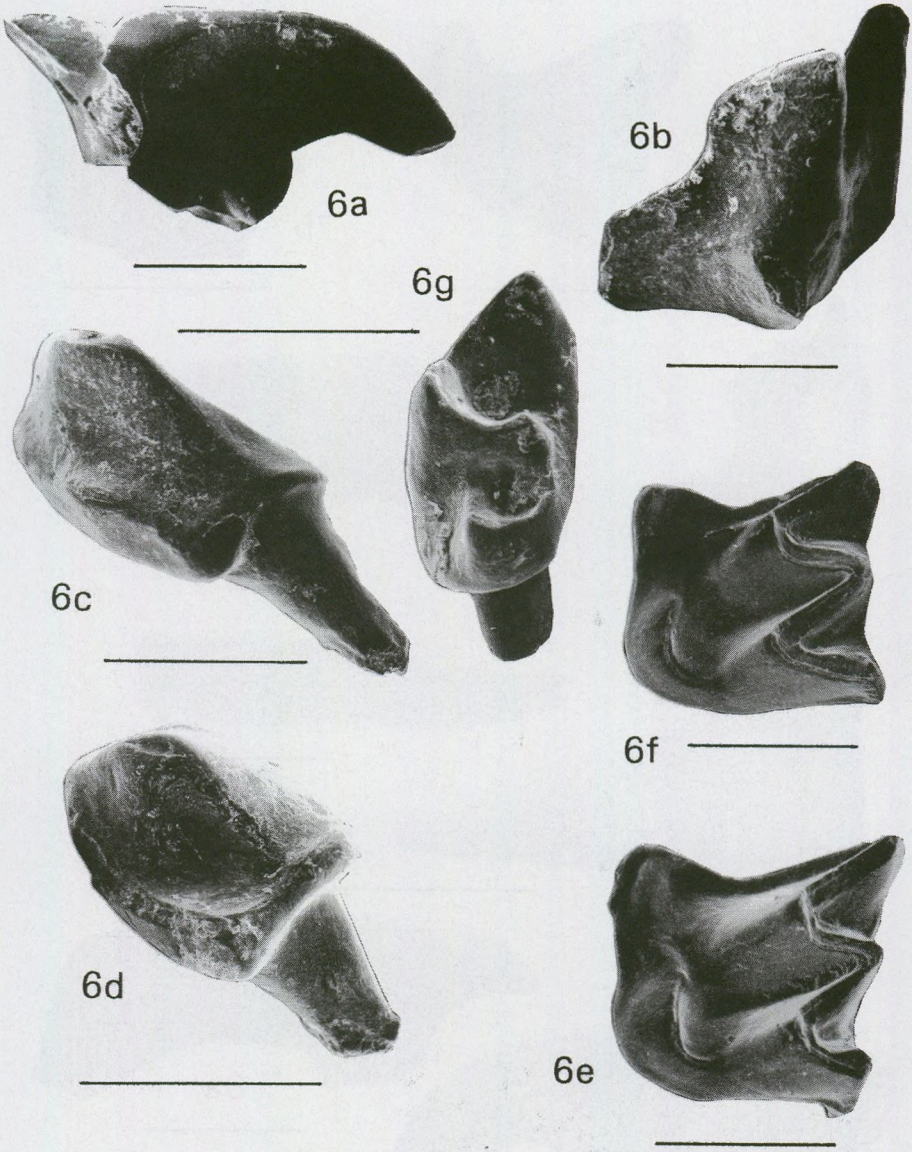

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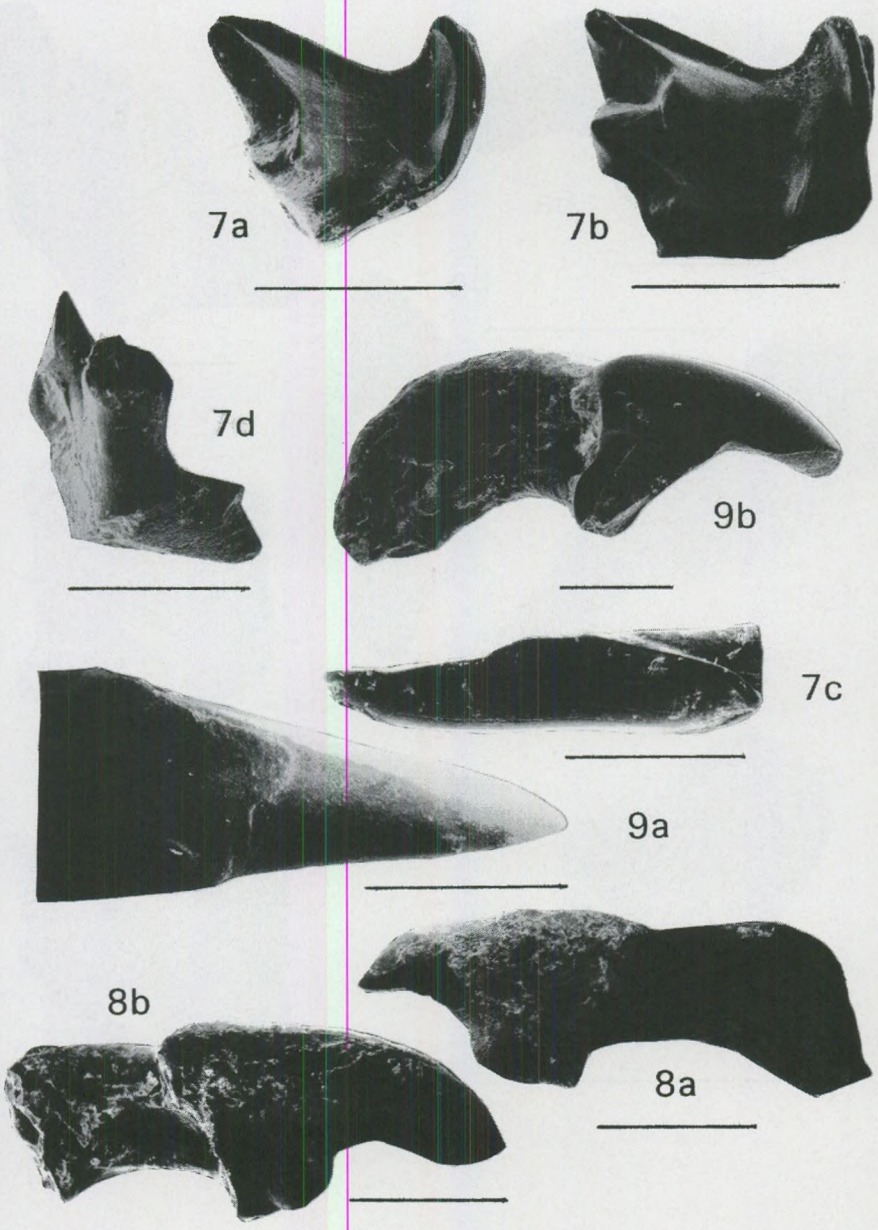
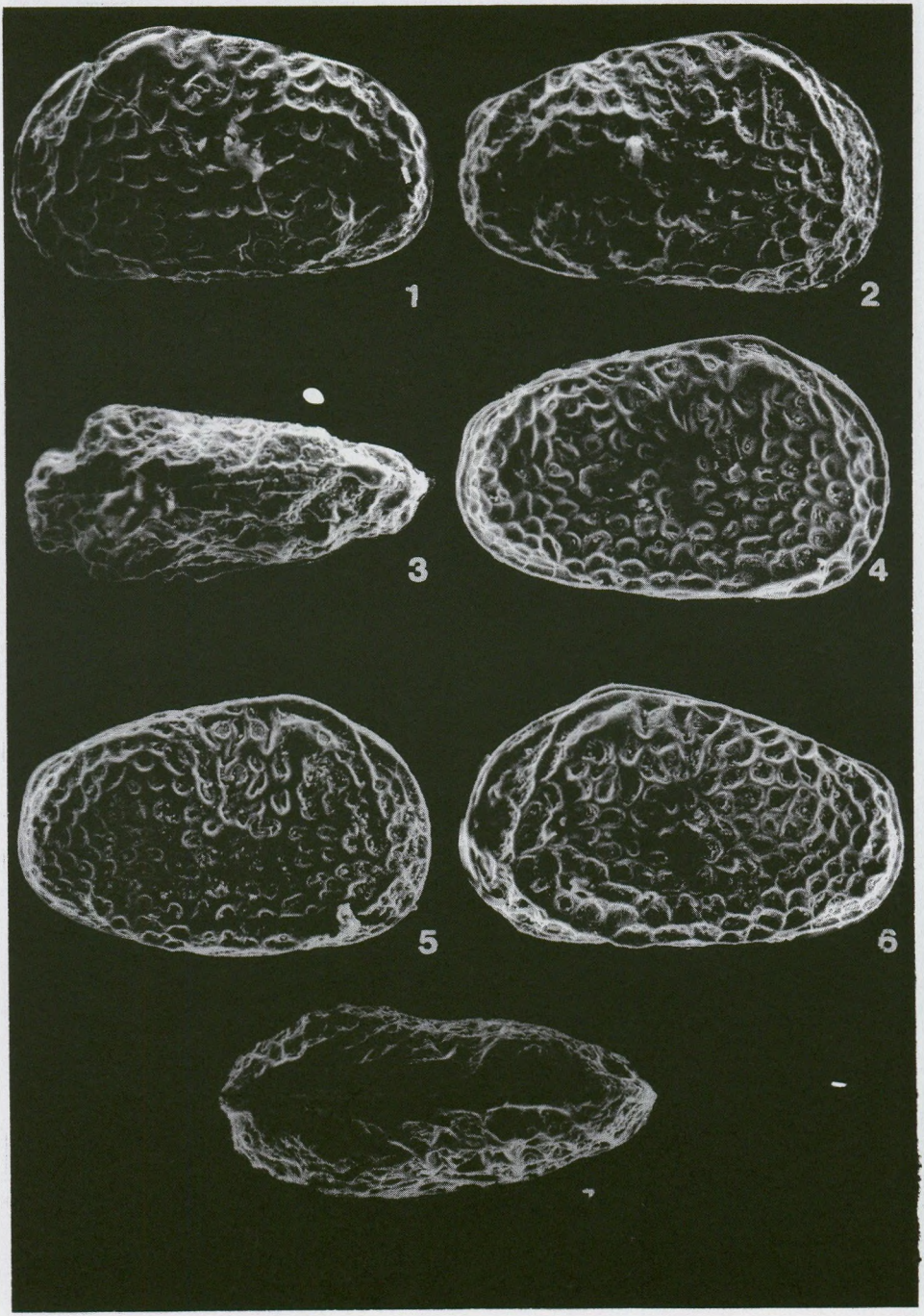


Plate 1



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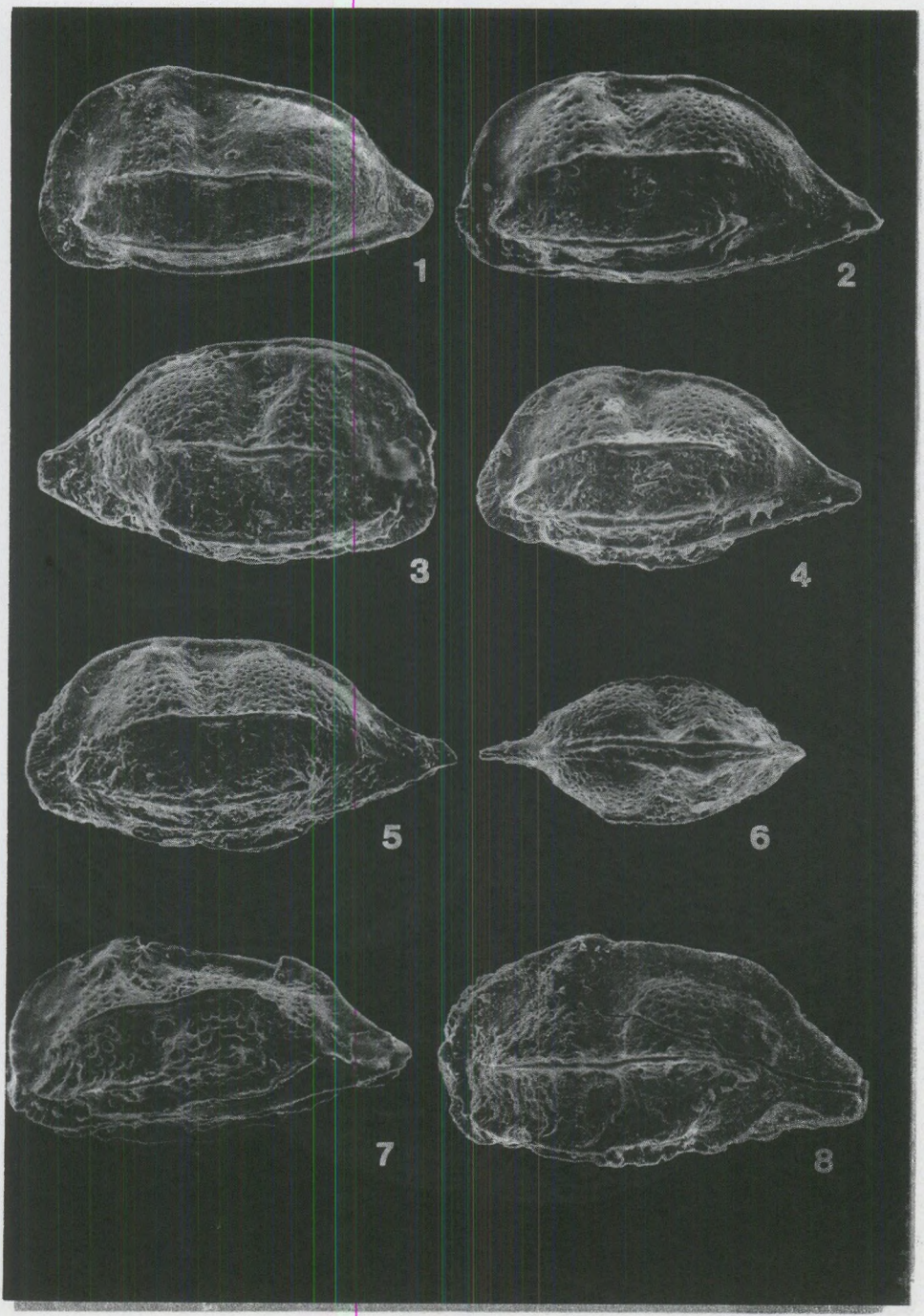

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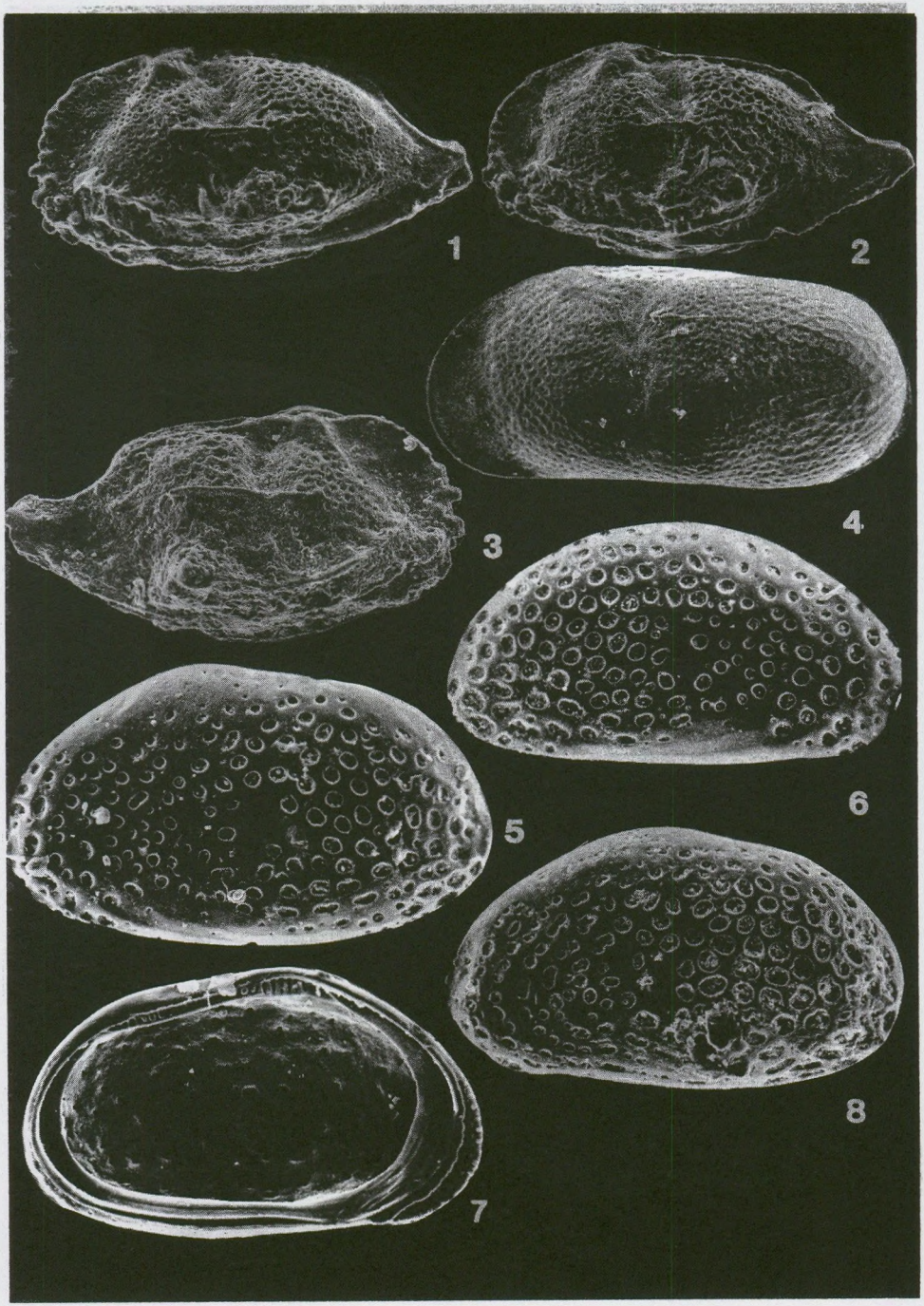

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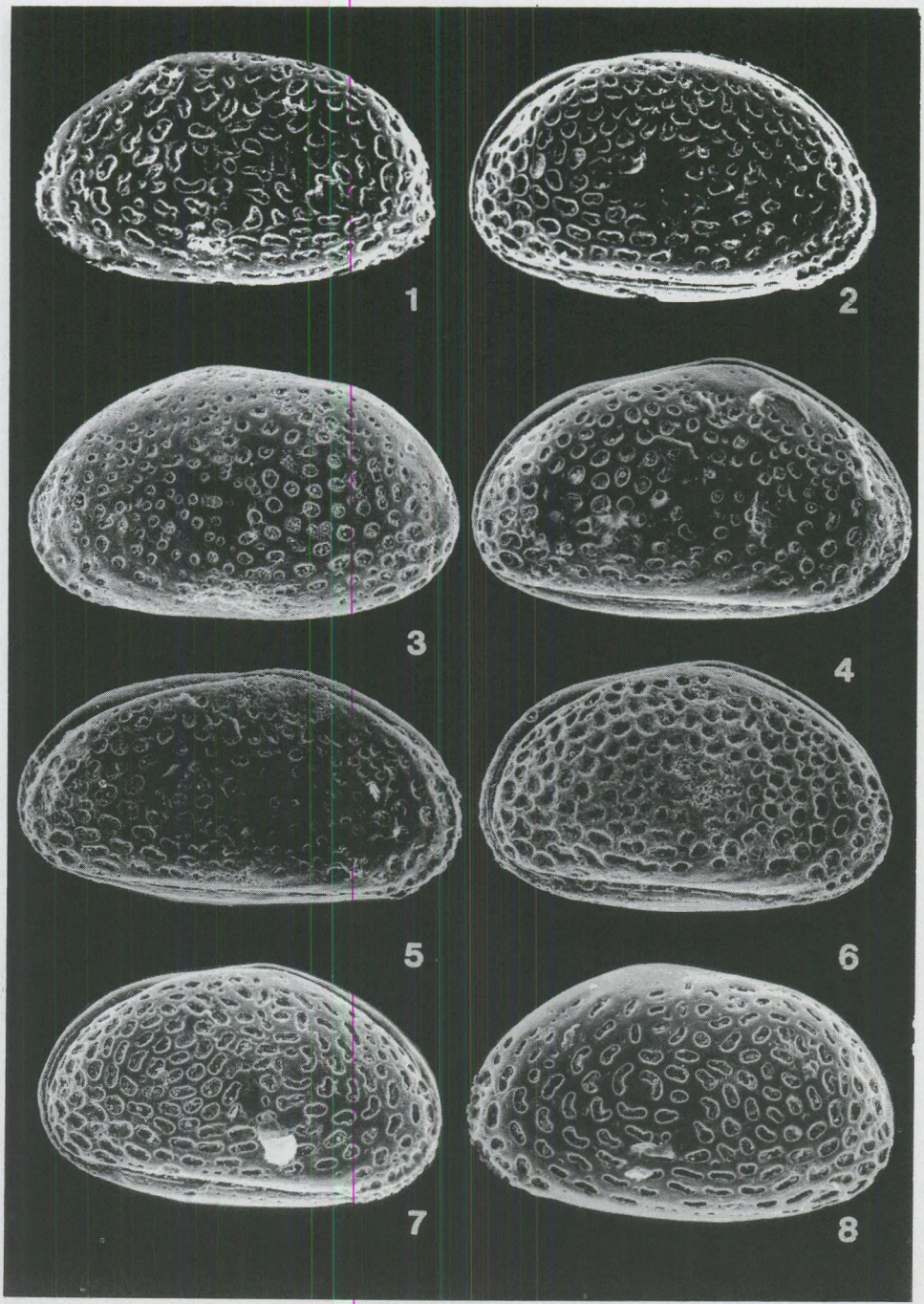

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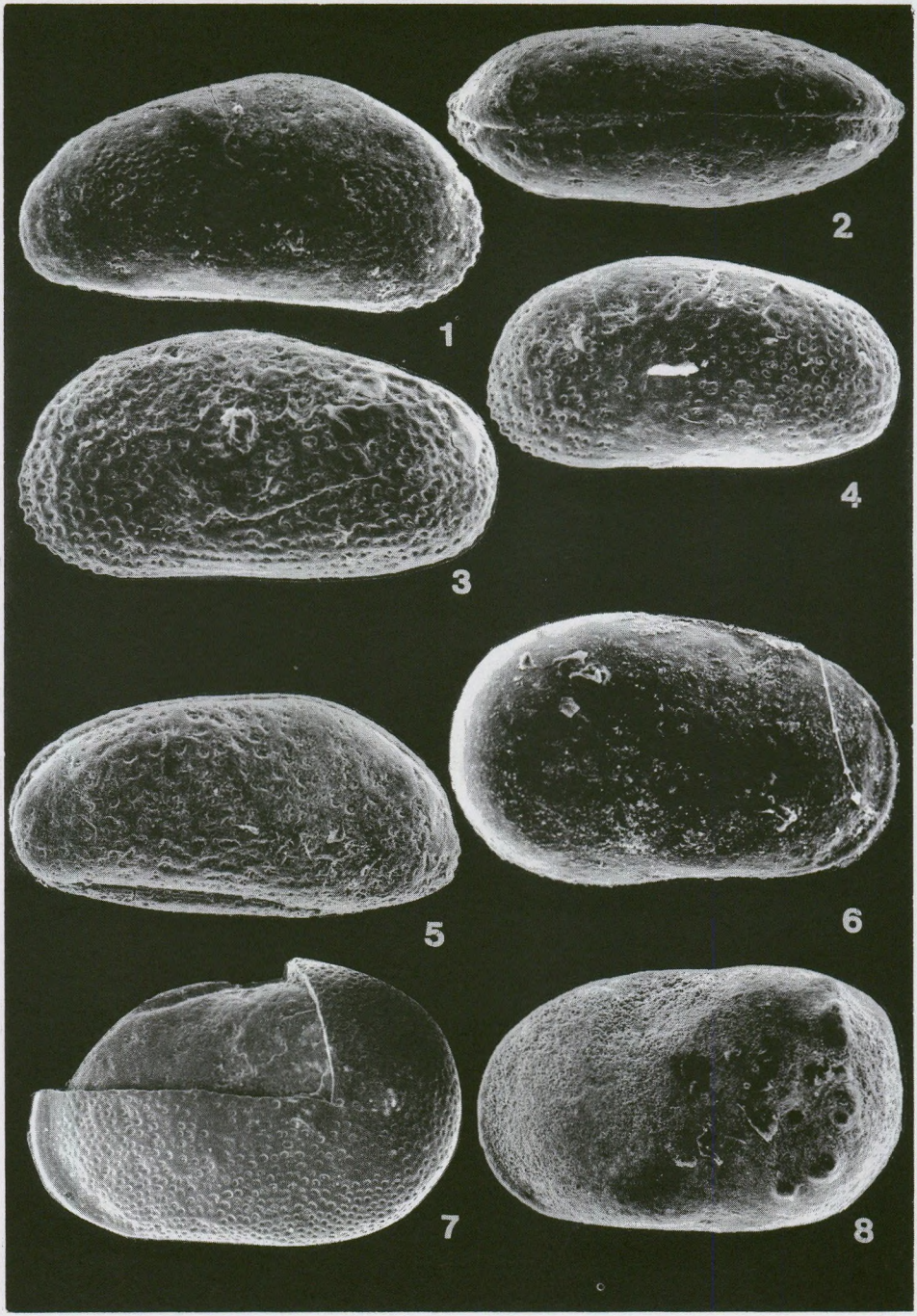

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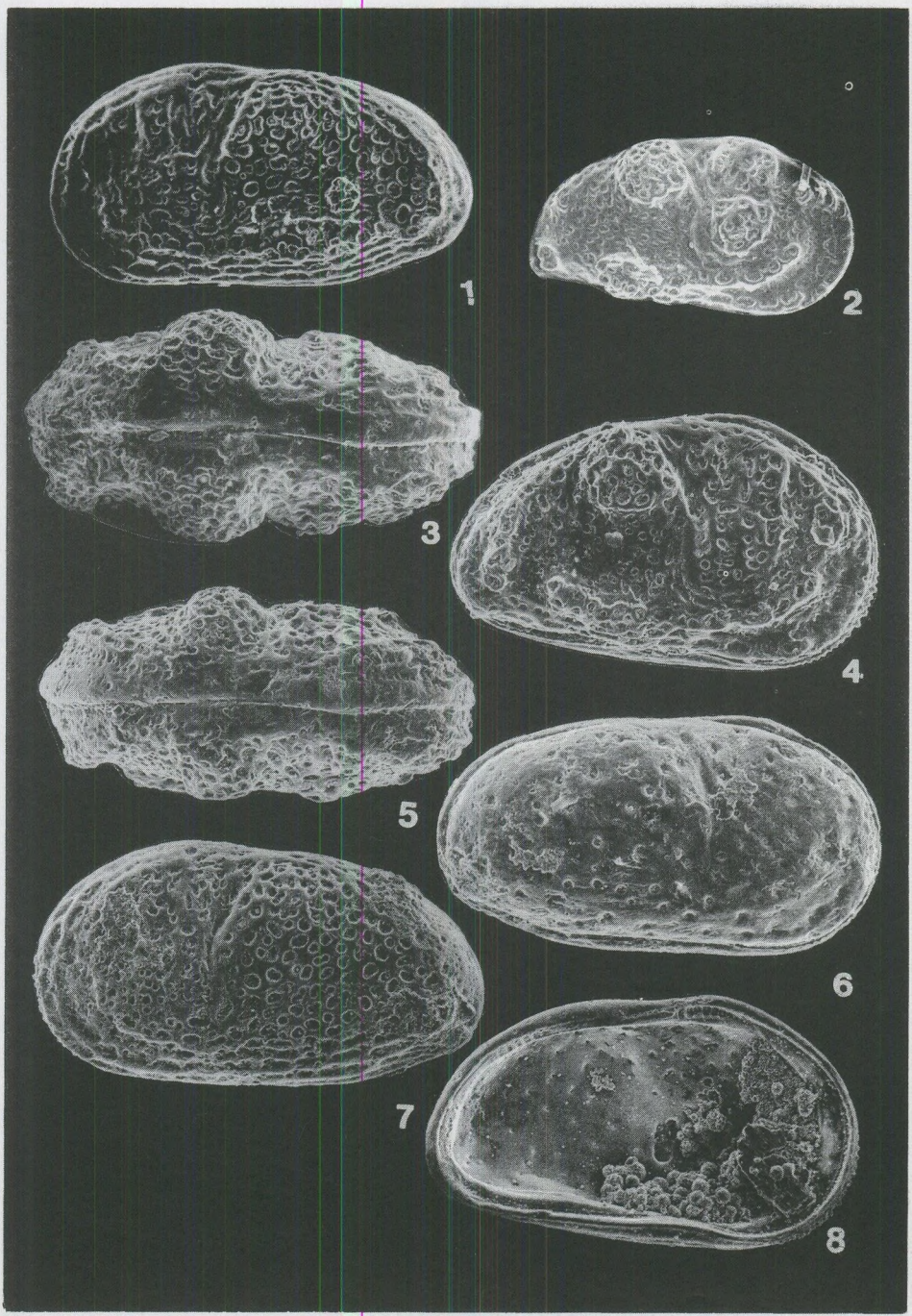

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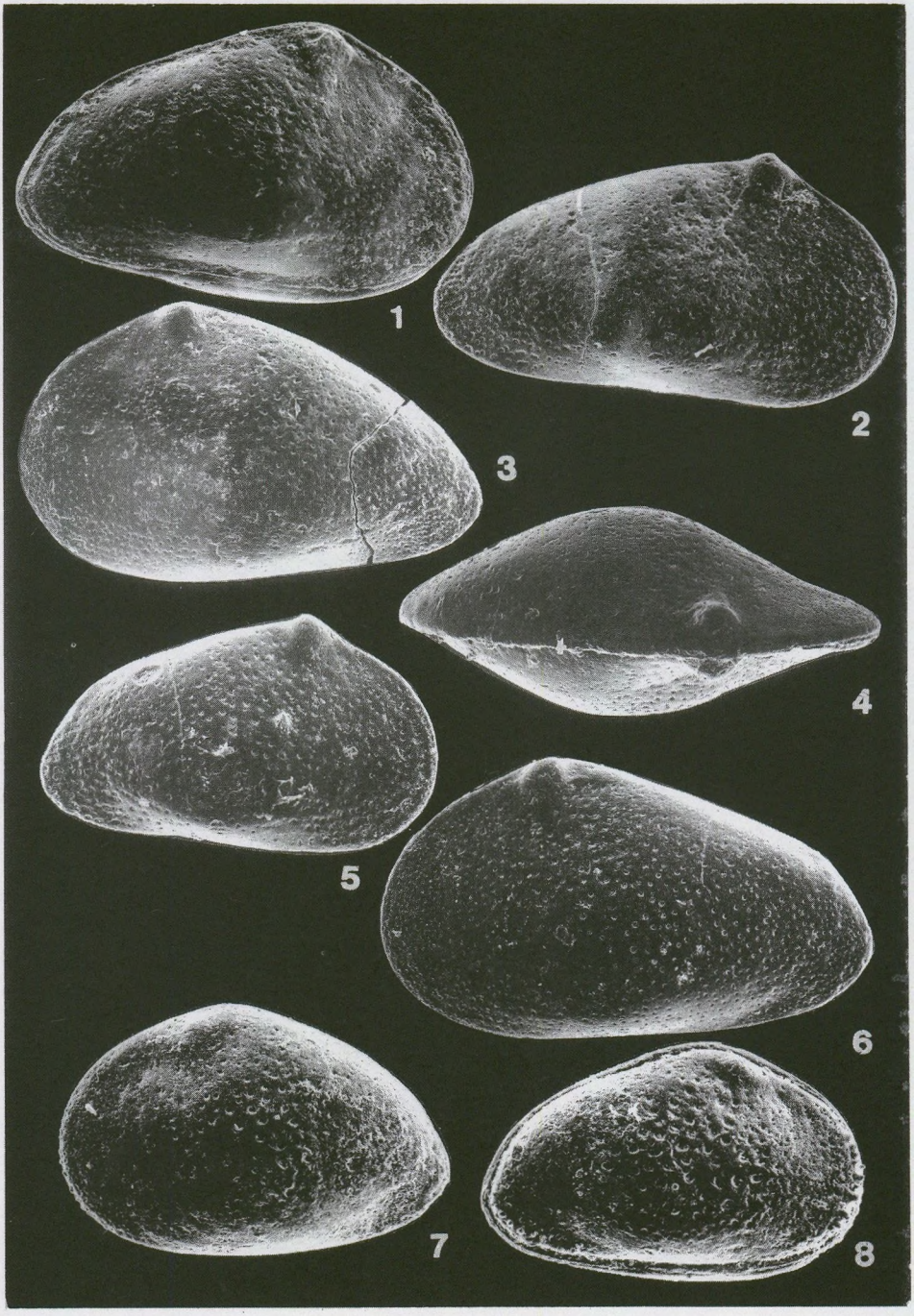

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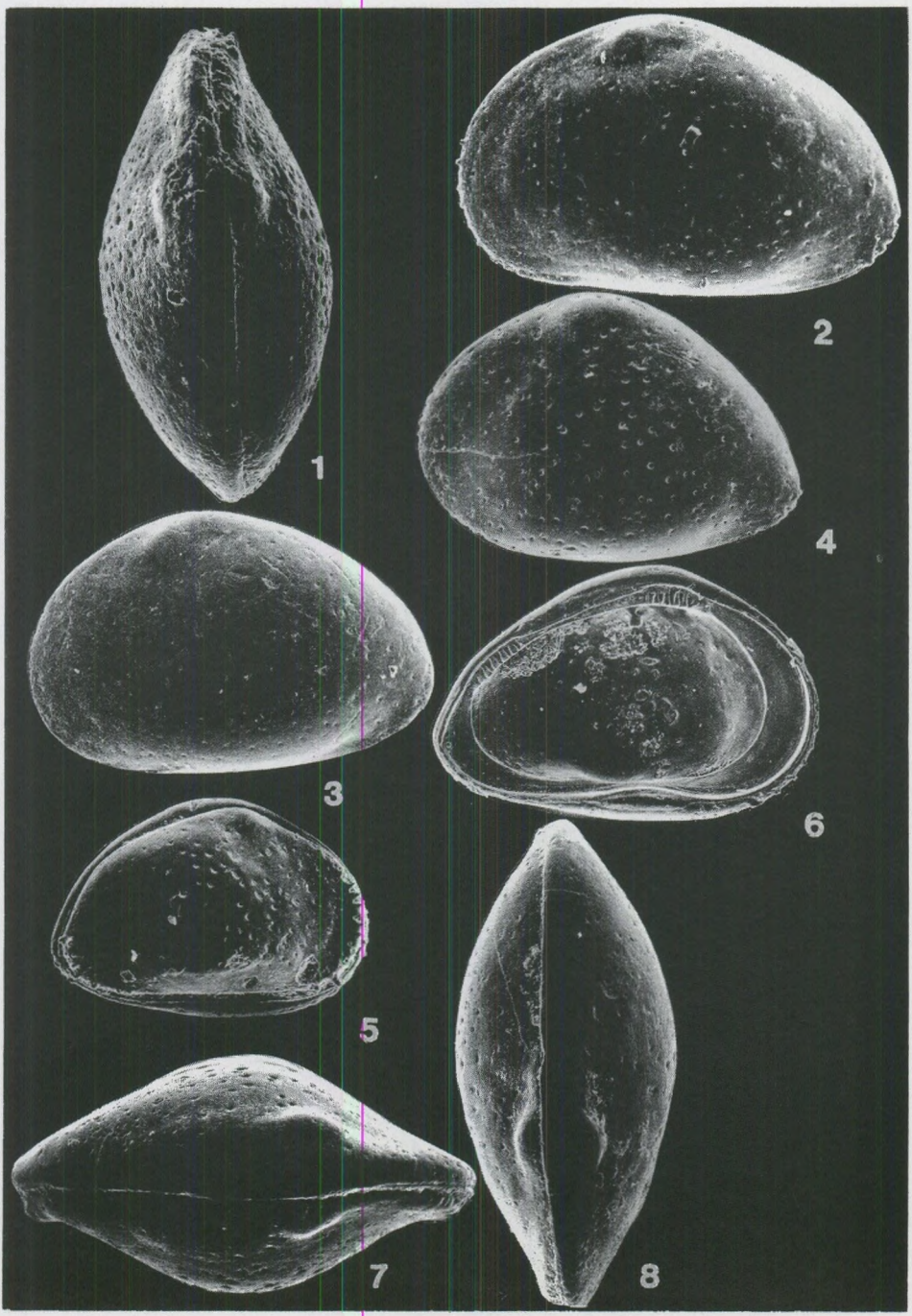

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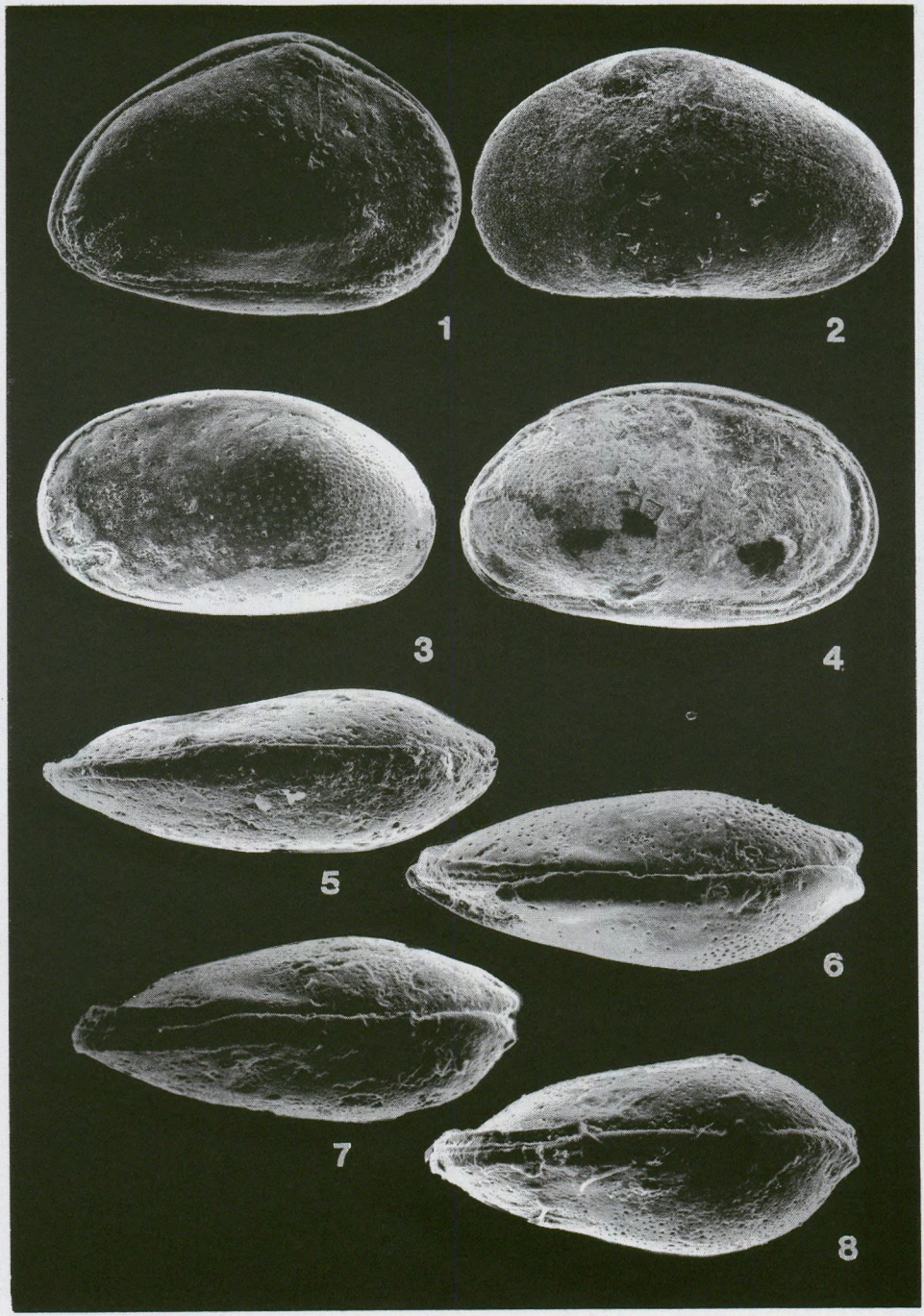

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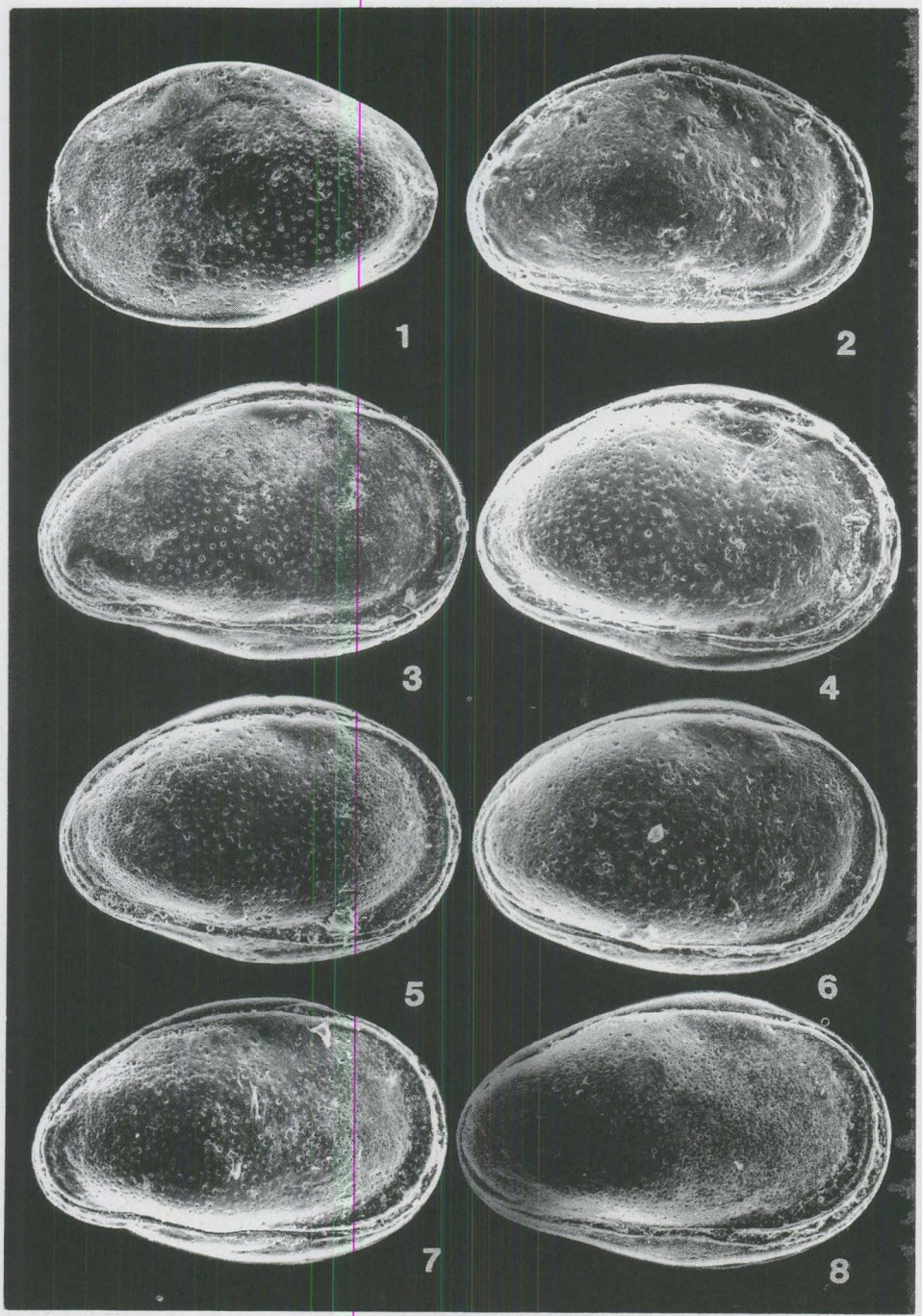

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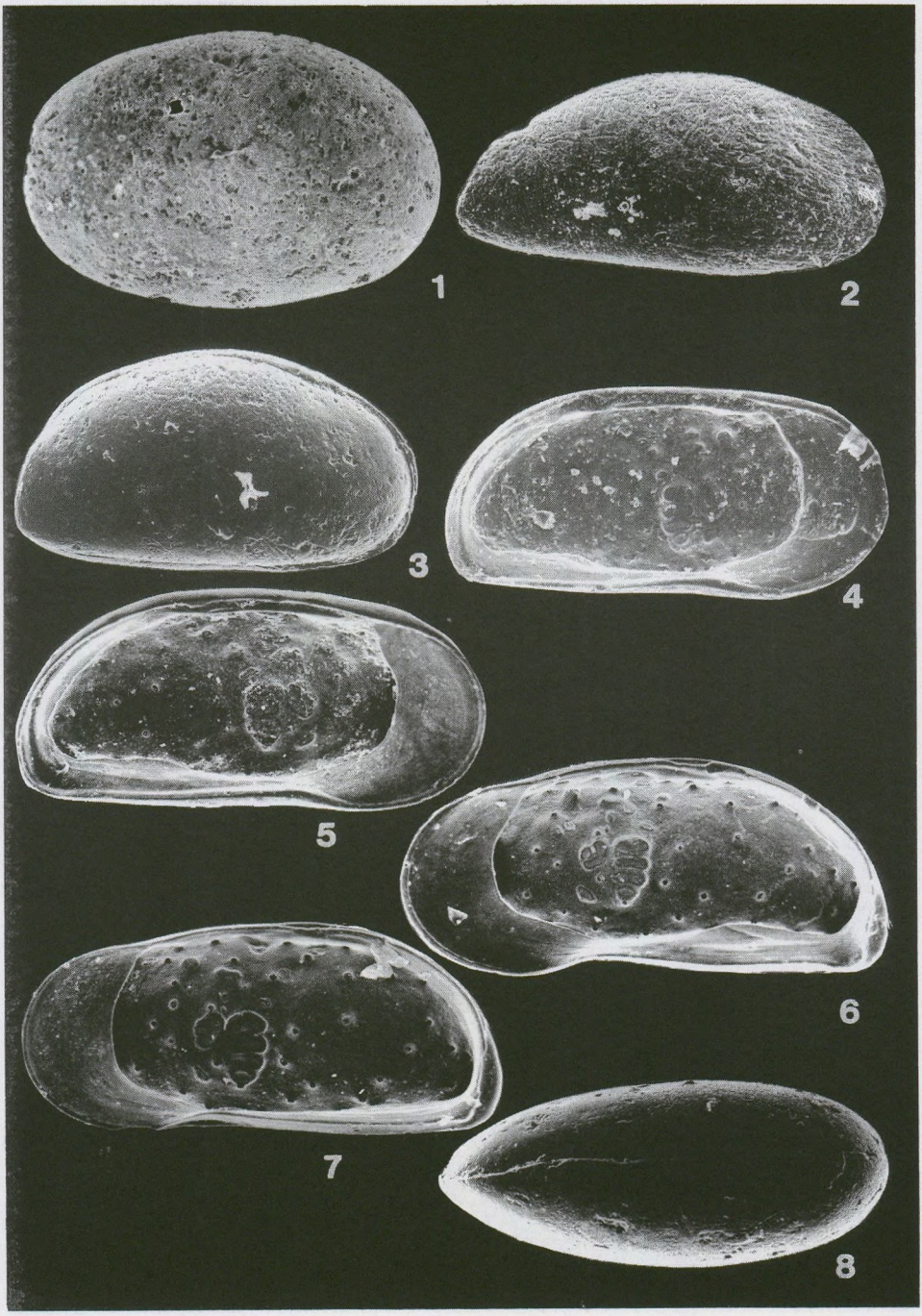

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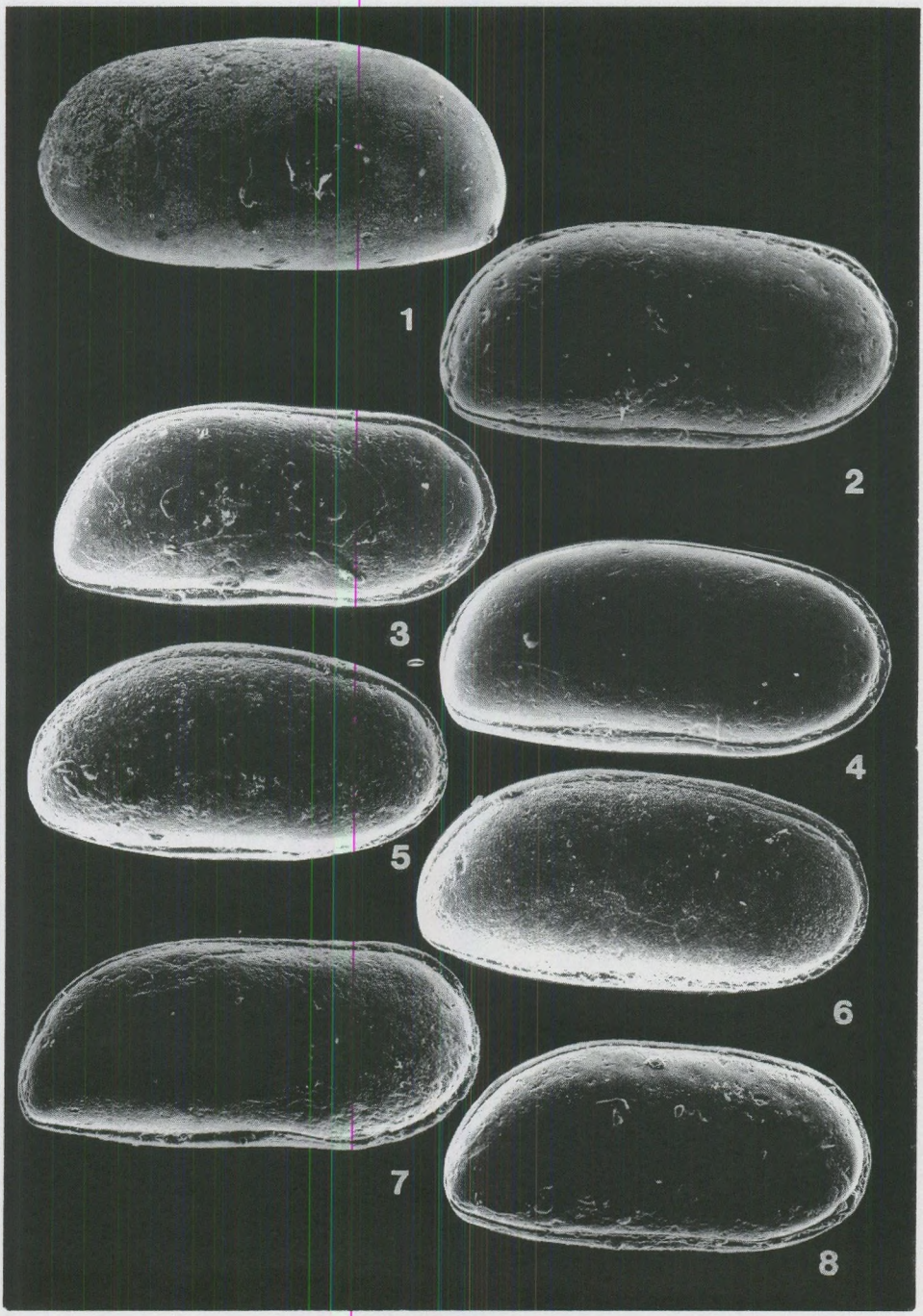

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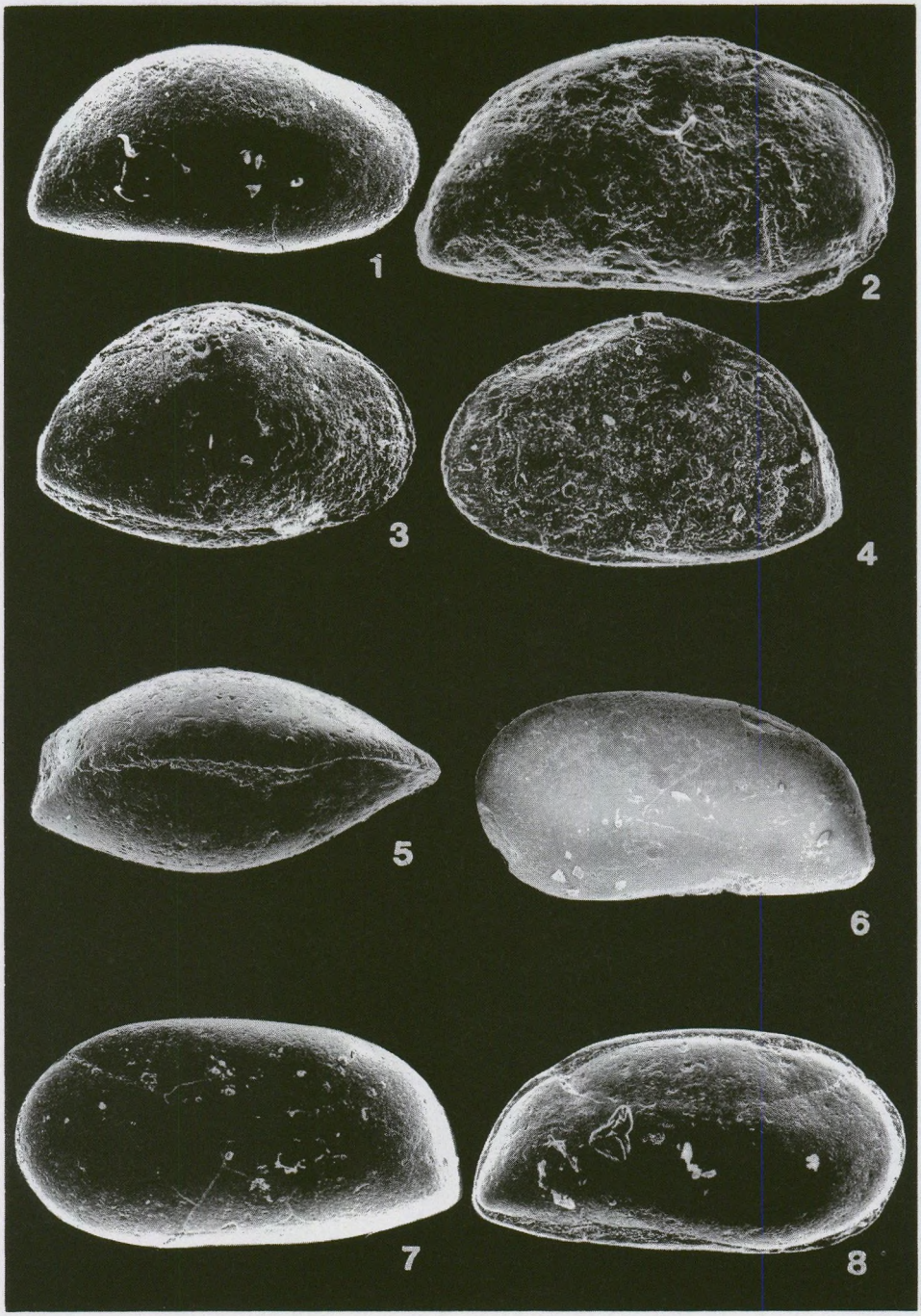

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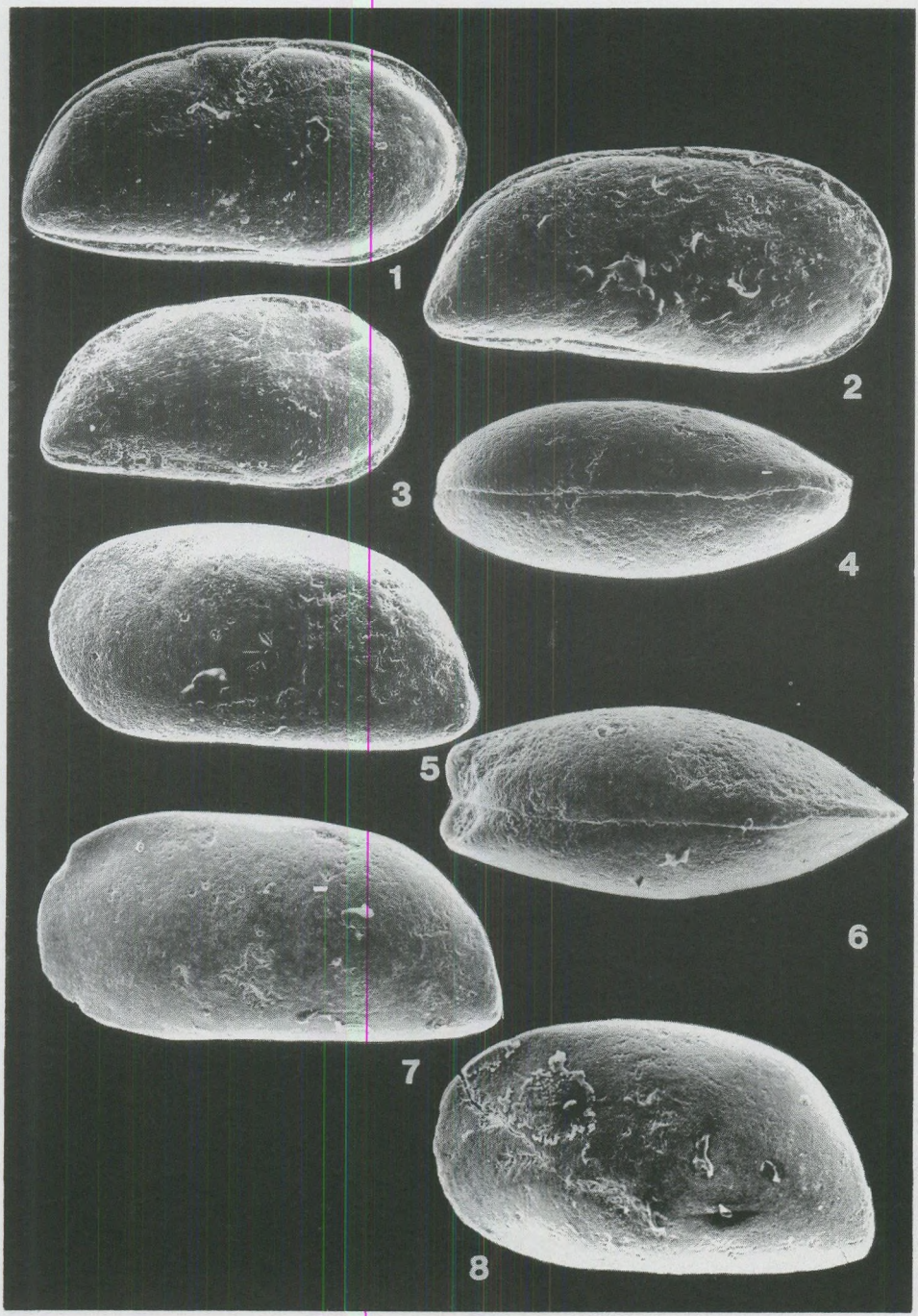

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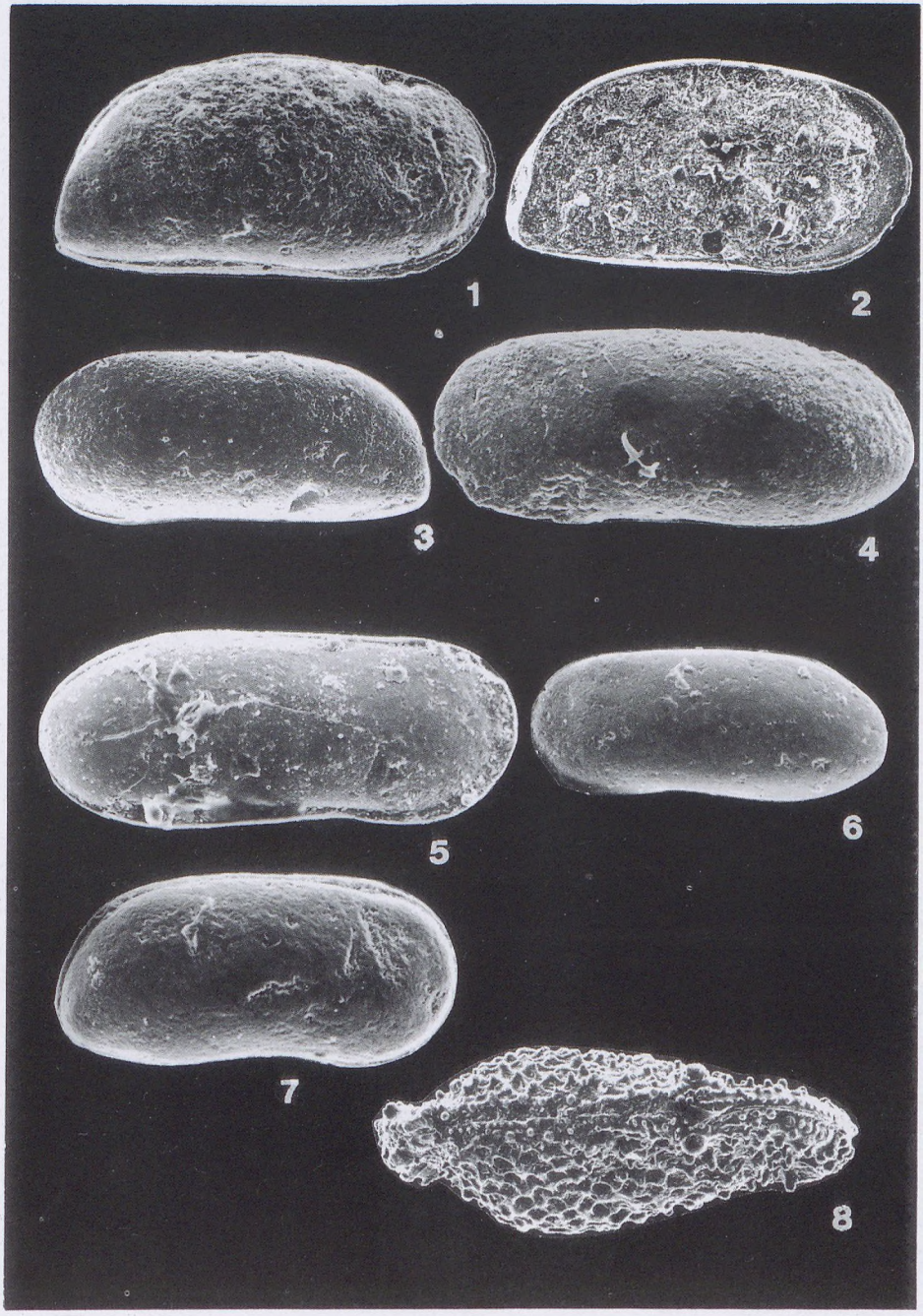

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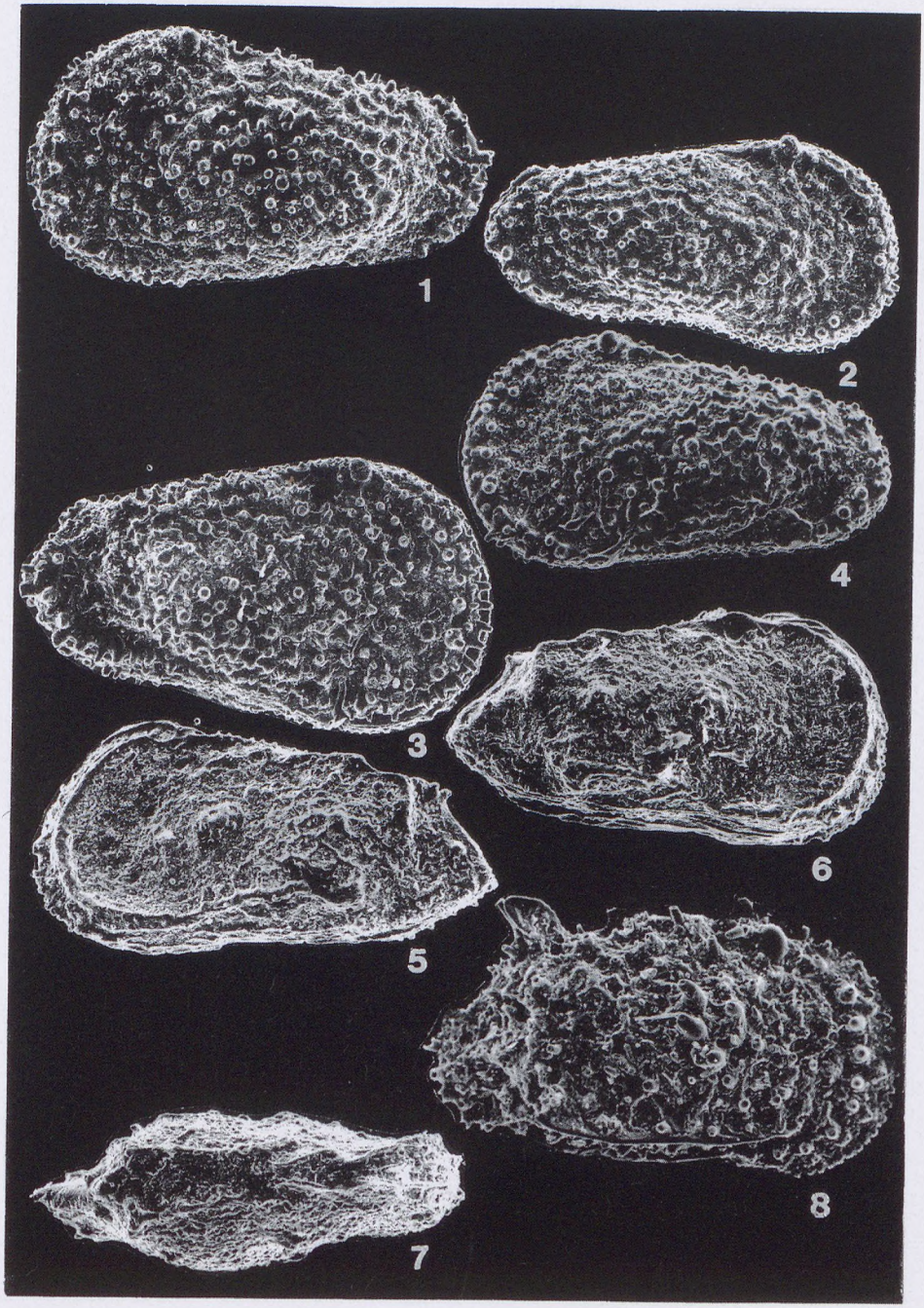

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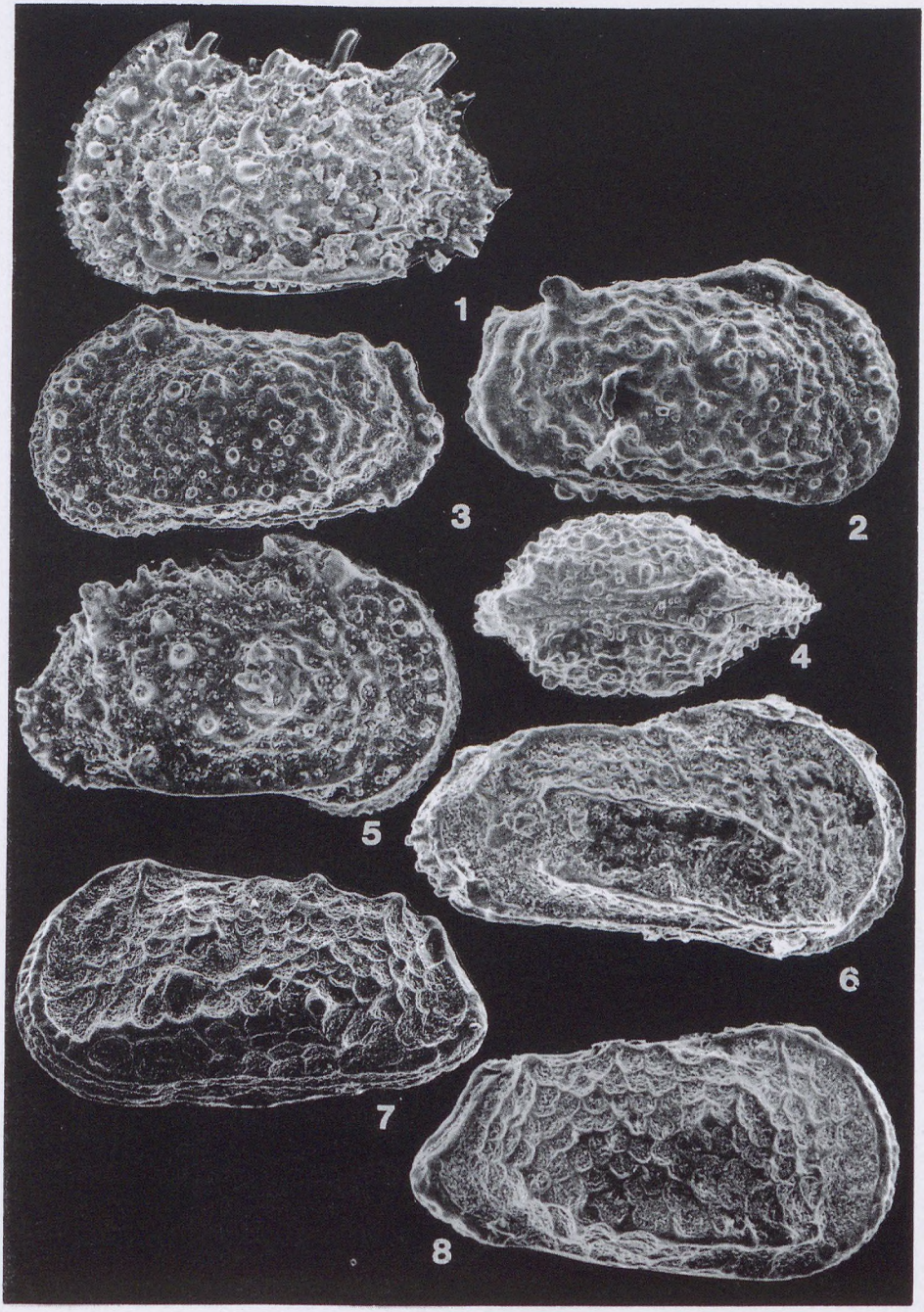

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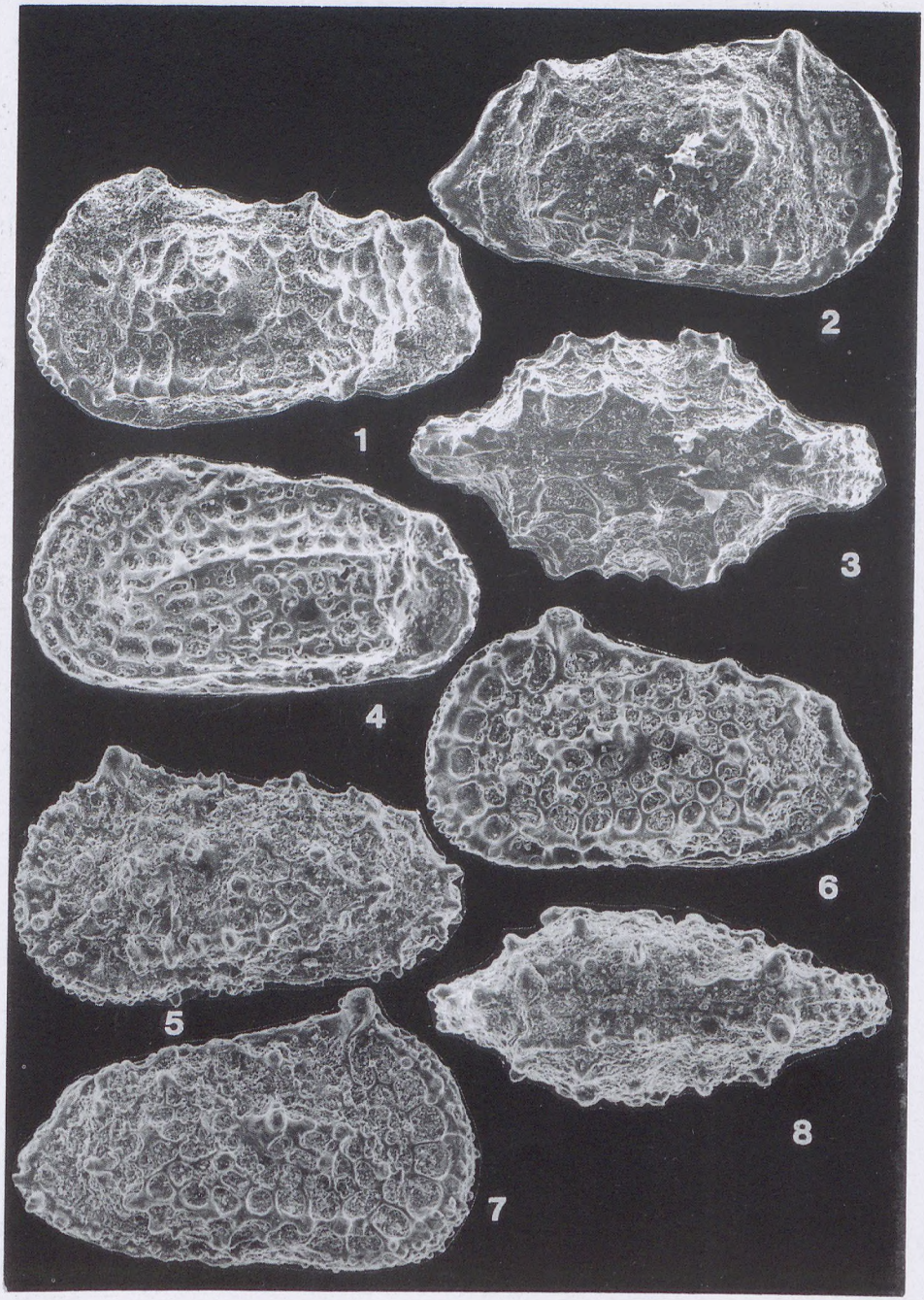

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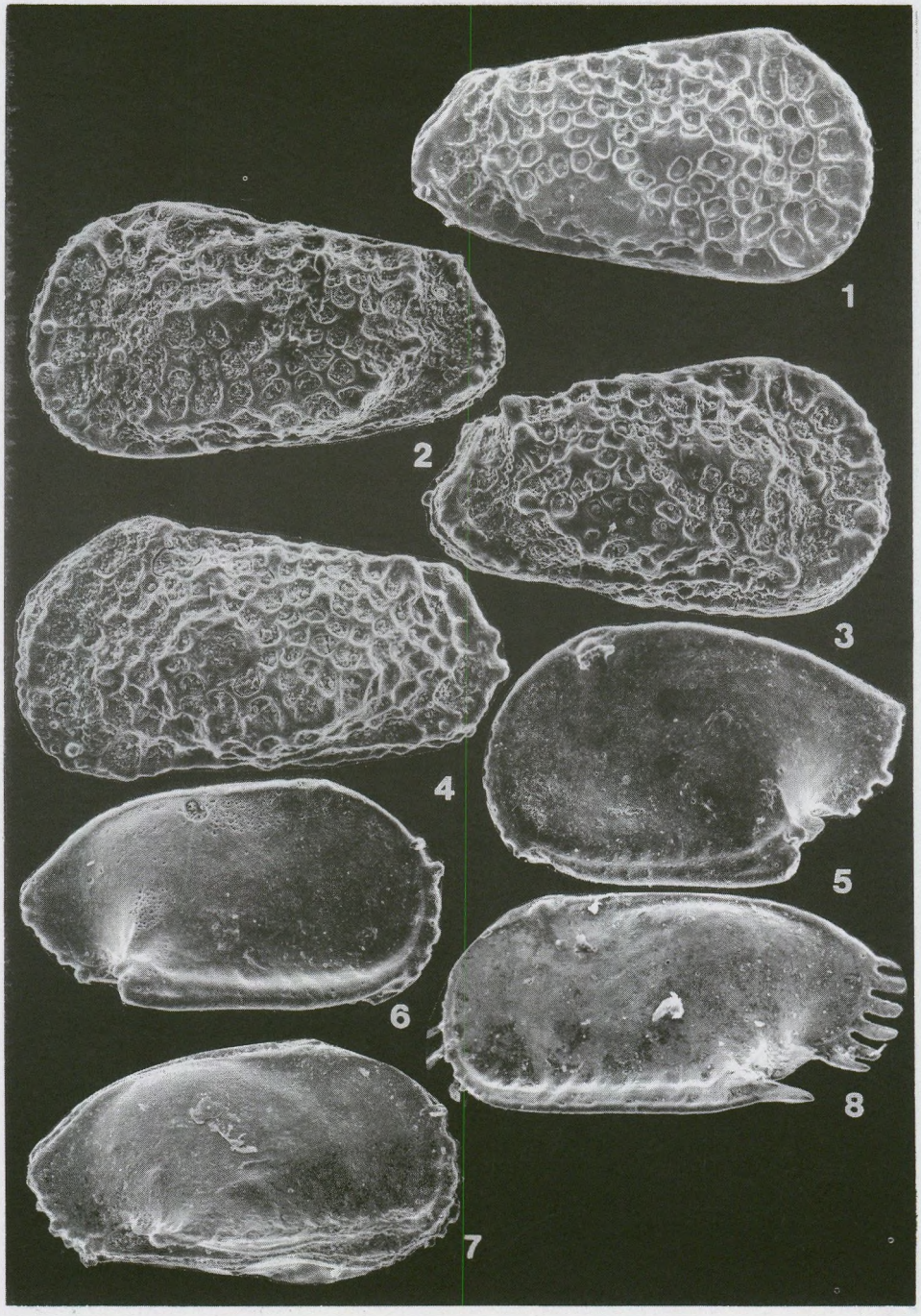

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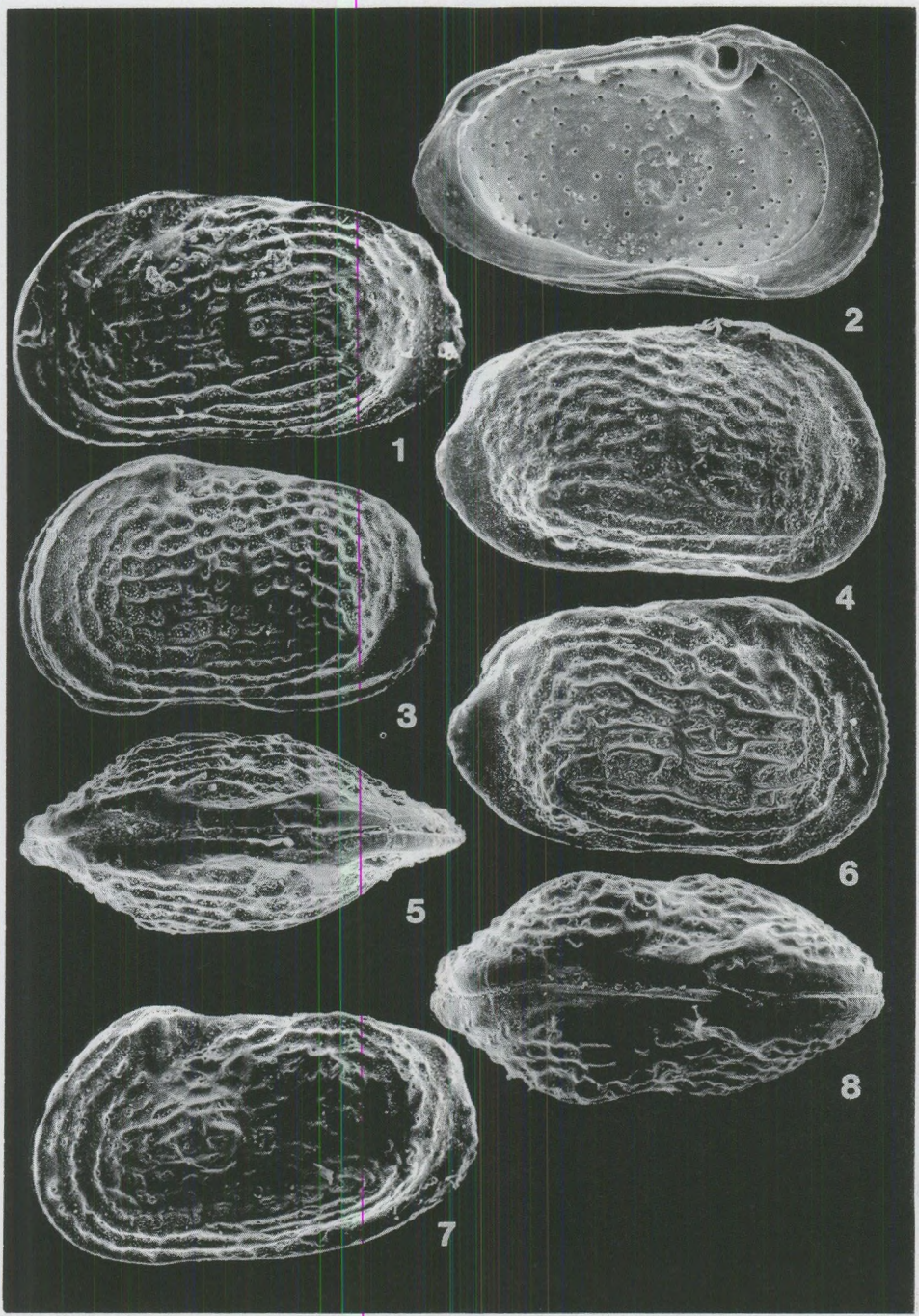

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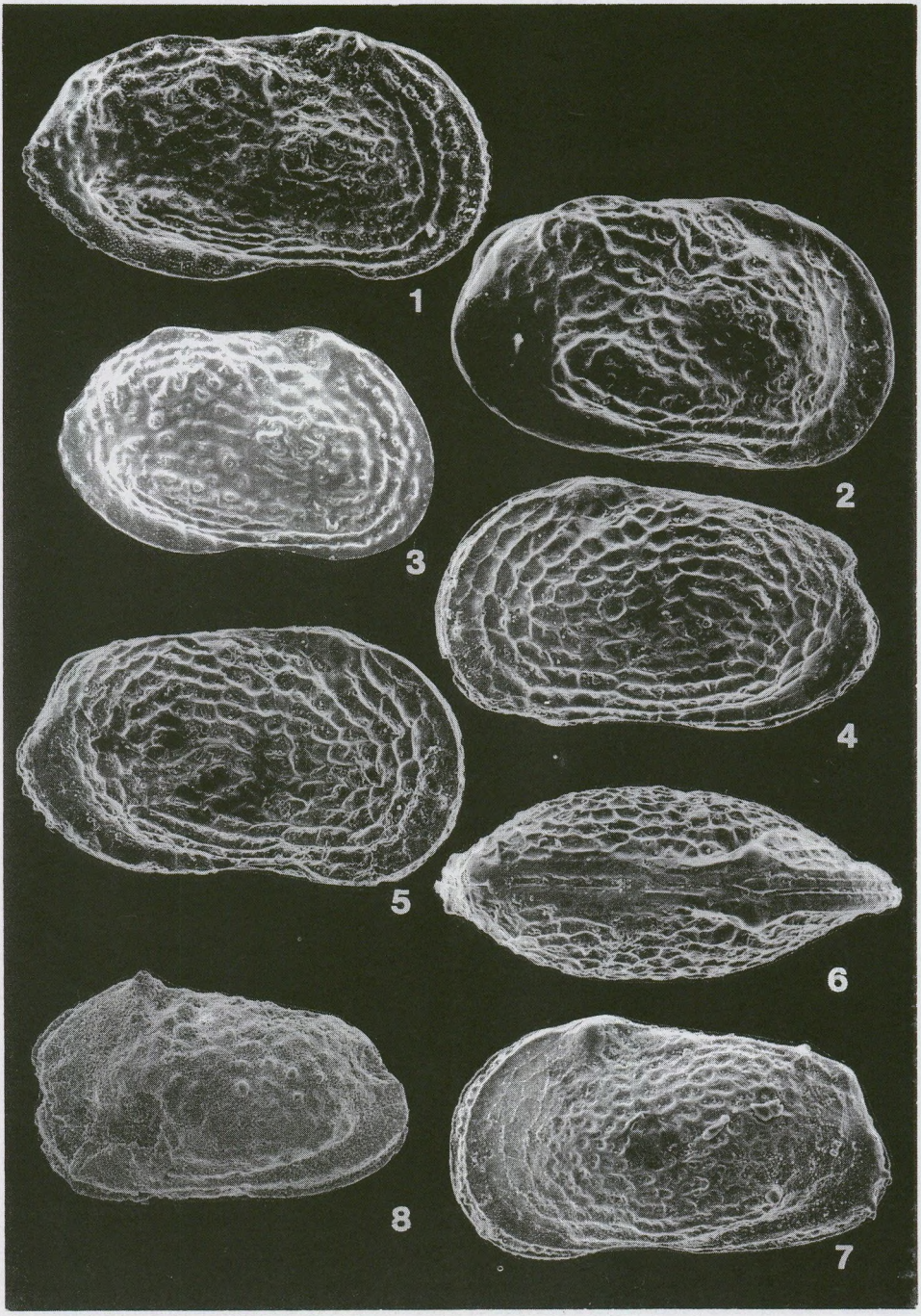

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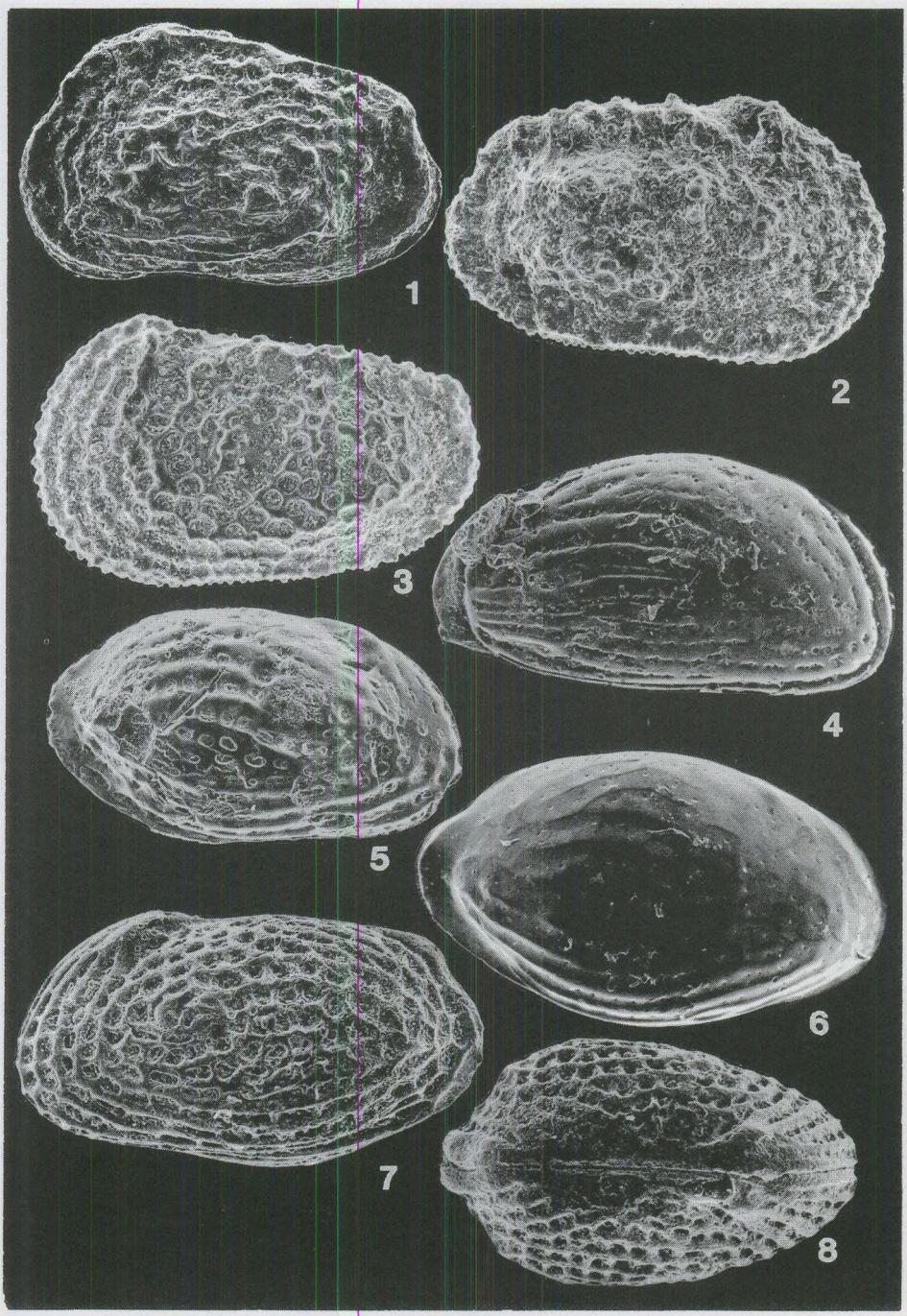

ISSN 0365-0634

Felelős kiadó: az Eötvös Loránd Tudományegyetem rektora
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