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A new Egerian (Upper Oligocene – Lower Miocene) gastropod fauna from the Esztergom Basin (NE Transdanubia, Hungary)

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Új egri (késő-oligocén–kora-miocén) korú Gastropoda-fauna az Esztergomi-medencéből (ÉK-Dunántúl, Magyarország)

Összefoglalás

Tanulmányunk a magyarországi egri korú tengeri molluszkafauna ismeretéhez járul hozzá egy újonnan feltárt rétegsor gastropodáinak leírásával. A lelőhely Esztergomtól északkeletre található a Duna jobb partján, kőzettípusa a Törökbálinti Formációt képviselő agyag és aleurolit. A gazdag fauna a Paratethysre jellemző egri taxonok mellett Magyarországról eddig nem ismertetett nemzetségeket és fajokat is tartalmaz, emellett négy új faj, *Pugilina katalinae* nov. sp., *Dorsanum strigoniense* nov. sp., *Sveltia nemethi* nov. sp. és *Merica krocki* nov. sp. leírását is lehetővé tette.

Tárgyszavak: Gastropoda, Paratethys, Esztergomi-medence, egri emelet, felső-oligocén, alsó-miocén

Abstract

In this paper, newly collected Egerian (Upper Oligocene – Lower Miocene) molluscs, mainly gastropods, are briefly described from the Esztergom Basin (N Hungary). The assemblage corresponds to the Egerian faunas of the Paratethys, but it contains new records as well. Four new species are introduced: *Pugilina katalinae* nov. sp., *Dorsanum strigoniense* nov. sp., *Sveltia nemethi* nov. sp. and Merica krocki nov. sp.

Key words: Gastropoda, Paratethys, Esztergom Basin, Egerian Stage, Upper Oligocene, Lower Miocene

Introduction

The small Esztergom Basin is a part of the Dorog Basin, and belongs to the Hungarian Paleogene Basin in the Upper Oligocene – Lower Miocene Egerian Stage. Oligocene deposits in this area were first analyzed in detail by HANTKEN (1871), later numerous works dealt with other Oligocene – Early Miocene localities of the vicinity, both in Hungary and Slovakia (see BÁLDI & NAGYNÉ GELLAI 1990). Oligocene rocks can be traced on the surface, in the bed of the Danube River, and data from boreholes show that they underlie the Quaternary deposits of the Dorog Basin with an average thickness of 400 m. The Egerian deposits belong to the Törökbálint Formation. The upper member of this unit is characterized by littoral to lagoonal deposits, the lower member, the „mollusc-bearing clay", consists of mainly deep sublittoral to shallow bathyal clayey siltstone. Its invertebrate fauna is characterized by a subtidal marine ecosystem. (For a detailed stratigraphical and geographical account of the Central Paratethyan Egerian Stage see BÁLDI 1973, 1986, BÁLDI et al. 1999, HARZHAUSER & MANDIC 2001).

Although Oligocene rocks have long been known on the surface on both sides of the River Danube at Esztergom, only a single paper (INKEY 1898) has ever referred to a river bank outcrop close to Párkány (Šturovo) on the left side of the Danube. This study revealed „Lower Mediterranean" (Early Miocene) *Margaritaceum*-layers, and emphasized that these could only be examined at low water. Despite the extensive research of more than 150 years, occurrences of fossiliferous rocks in the river bed or on the river banks around Esztergom are unknown or at least have never been mentioned. Neither MAJZON (1940) and SENEŠ (1958) — who dealt with Oligocene deposits in the vicinity —, nor

KORPÁS (1981), BÁLDI (1986) and BÁLDI & NAGYNÉ GELLAI (1990) said anything about such rocks in their comprehensive works.

Up until now, the outcrop described in the present paper has been known only to private fossil collectors. Extreme low water during the summer of 2015 permitted the exploration of the locality on the bank east of Esztergom, and allowed intensive field works to be carried out. These resulted in a rich collection of mollusc material collected by the authors from newly excavated test pits, and from the river bed *ex situ*. This paper aims to contribute to the knowledge of the Egerian marine gastropod fauna of Hungary by providing a description of this assemblage, and also by recording several gastropod species previously unknown in Hungary. The mollusc assemblage has now been donated to the Hungarian Natural History Museum, Budapest.

Description of the locality

The site is located east of Esztergom-Szentgyörgymező, on the bank and in the bed of the Danube (47° 48' 50'' N, 18° 45' 4'' E) *(Figure 1)*. The outcrop reveals different types of Egerian rocks of about 350 m length and 25 m width. In this study only the stratigraphically lower part of the sequence of 128 m is examined. This sequence consists of bathyal mollusc-bearing clayey siltstone (facies unit No. 4 in BÁLDI & NAGYNÉ GELLAI 1990 and SZTANÓ et al. 1998), and is divided into nine fossiliferous units *(Figure 2)*.

Unit E, 3 m in length, was investigated with a test pit that yielded a small mollusc material that was similar to that of Unit C, albeit with a lower diversity. Unit D2 (1 m) was investigated with a small pit. Unit C (6 m) was investigated by collecting material from the surface of the river bed, over a width of 25 m and to a depth of 10 cm, as well as with a test pit. It yielded the richest material with more than 3400 gastropod and bivalve specimens. Besides molluscs there was the sporadic occurrence of solitary corals, fragmentary decapod remains and fish teeth. Unit B1 (8 m) was investigated at a maximum 40 cm water level with collecting work taking place from the river bed over a

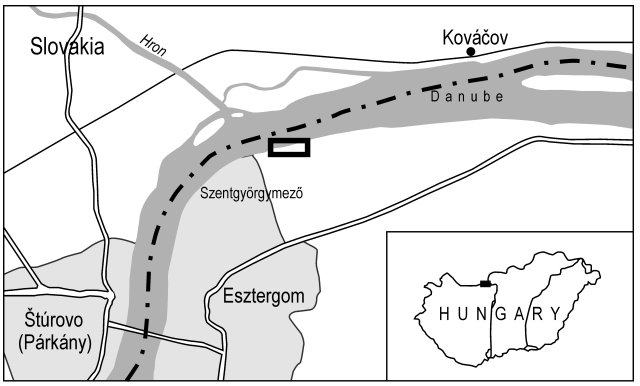

Figure 1. Location of the new Egerian site, East of Esztergom–Szentgyörgymező

1. ábra. *Az új feltárás Esztergom–Szentgyörgymezőtől keletre a Duna parton*

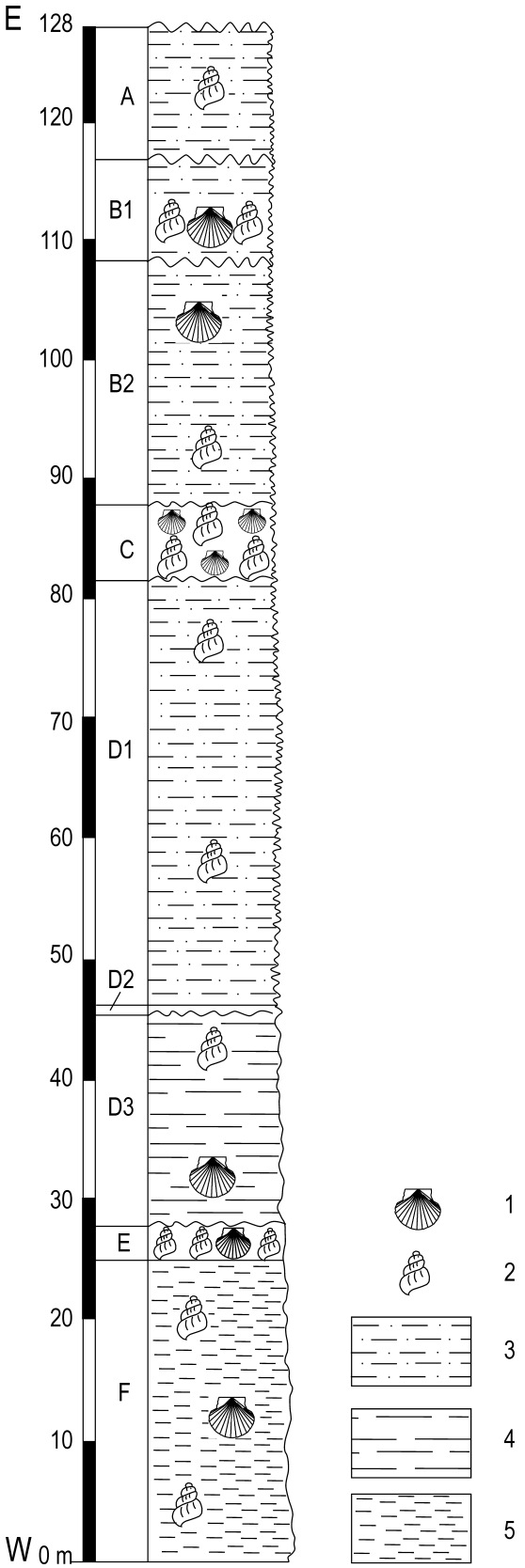

Figure 2. The Lower Egerian outcrop at Esztergom

1 – bivalve, 2 – gastropod, 3 – well-bedded grey, clayey siltstone, 4 – grey, clayey siltstone, 5 – non-layered, grey clay

2. ábra. *Az esztergomi kora-egri korú feltárás vázlatos rajza*

1 - kagyló, 2 - csiga, 3 - rétegzett, szürke, agyagos aleurolit, 4 - szürke, agyagos aleurolit, 5 - rétegzetlen, szürke agyag

width of 15 m and to a depth of 10 cm. The material in this unit corresponds to that of Unit C, albeit with a lower diversity.

The mollusc fauna

The bivalves and scaphopods are mainly preserved as fragments. The identified fauna includes the following: Classis Bivalvia LINNAEUS, 1758: *Yoldia raulini* COSSMANN et PEYROT, 1912, *Crassostrea cyathula* (LAMARCK, 1806), *Glycymeris latiradiata* (SANDBERGER in GÜMBEL, 1861) (Plate 1, figs 1–2), *Laevicardium tenuisulcatum* (NYST, 1836), *Cyclocardia orbicularis* (SOWERBY, 1825), *Pitar polytropa* ANDERSON, 1958, *Macoma elliptica* BROCCHI, 1814, *Pholadomya puschi* GOLDFUSS, 1837.

Classis Scaphopoda BRONN, 1862: *Antalis kickxii* (NYST, 1843), *Antalis acuta* HÉBERT, 1849 [= *Dentalium apenninicum* (SACCO) in BÁLDI 1973], *Dentalium* sp.

The gastropod material is shown in *Table 1.* The analysis is based on the list of characteristic Egerian mollusc taxa arranged by BÁLDI & STEININGER (1975), completed with other records from the Central Paratethys (NOSZKY 1936, BÁLDI 1973, 1976, 1986, BÁLDI & SENEŠ 1975, HARZHAUSER & MANDIC 2001). Besides the revision of the classical Egerian mollusc collections of the Hungarian Natural History Museum, Budapest, two rich sets of Egerian gastropod materials were examined in Helmut KROCK's and Tamás NÉMETH's private collections.

Our assemblage consists of 4108 well-preserved gastropod specimens. Six of the species form 66.3% of the material, the most frequent taxa are *Dorsanum strigoniense* nov. sp. (689 spp.), *Diastoma elongata* BRONGNIART (514 spp.), *Haustator venus* D'ORBIGNY (460 spp.), *Orthosurcula* ex gr. *regularis* (KONINCK) (403 spp.), *Volutilithes* cf. *apenninica* MICHELOTTI (337 spp.), and *Nassarius* cf. *intercisus* (MICHELOTTI) (323 spp.).

The assemblage clearly corresponds to the Egerian. Besides the above mentioned taxa, it contains characteristic Egerian index taxa, and the newly recorded gastropods — which represent different Boreal, East Atlantic and North Tethyan genera — also confirm the Late Oligocene age. The high proportion of *Dorsanum* (16.7% in the whole assemblage) corresponds to the Chattian acme of the Dorsaninae. The material confirms the extended distribution of three species, up until now only known from the type region (vicinity of Eger), such as *Nassarius hevesensis* (BÁLDI), *Marginella vadaszi* BÁLDI, and *Raphitoma valdecarinata* BÁLDI. The fauna list presented here can be completed with several Egerian taxa from earlier collection works carried out in the locality: *Turehua doboi* (NOSZKY, 1936), *Conilithes egerensis* (NOSZKY, 1936), *Turricula telegdirothi* (NOSZKY, 1936), *Sveltia nemethi* nov. sp. (all *ex situ*, from T. NÉMETH's private collection), and *Terebra telegdi* FINLAY, 1927 (new name for *Terebra simplex* TELEGDI-ROTH, 1914, a primary homonym), *Asthenotoma obliquinodosa* (SANDBERGER, 1860), *Clavatula* sp., ?*Domenginella* sp., *Teinostoma* p., *Eulima* sp., *Pyramidella* sp., *Odostomia* sp., Rissoidae sp. (all *ex situ*, H. KROCK's private collection). Nevertheless, several zonal indices frequent at other Paratethyan localities are absent: e.g. genera *Gibbula*, *Jujubinus*, *Athleta*, *Ringicula*, *Tibia,* or species *Turritella percarinata* TELEGDI-ROTH, 1914, *Nassarius schlotheimi* (BEYRICH, 1854), *Euthriofusus burdigalensis* (DEFRANCE, 1820), *Egerea collectiva* GÁBOR, 1936. The diversity of bivalves is also relatively low.

From a palaeoecological point of view, the whole mollusc assemblage represents a medium deep sublittoral to shallow bathyal community. The dominant gastropod genera in all four fossiliferous units are *Diastoma*, *Turritella*, *Fusinus, Nassarius*, *Dorsanum*, *Volutilithes* and *Orthosurcula*. However, changes of proportions can be traced. The different faunal compositions of Units E and C might indicate sea-level fluctuations. In Unit E the ratio of representatives of a sublittoral shallow water community (*Granulolabium*, *Tympanotonos*, *Typhis pungens*, *Orthosurcula regularis*, Aporrhaidae, Ampullinidae, Melongenidae) is higher than in Unit C, in the latter deep sublittoral – shallow bathyal facies forms occur (e.g. *Yoldia raulini*, *Pholadomya puschi*) with much higher ratio of the Nassariidae.

Systematic palaeontology

Only a few taxa of great importance are dealt with systematically in the present paper. Most of them are reported for the first time from the Egerian of Hungary: *Paziella* sp., *Volutilithes* cf. *apenninica* (MICHELOTTI), *Scalaspira elegantula* (PHILIPPI), *Parvisipho scrobiculatus* (BOLL), *Pseudolatirus mayeri* (BELLARDI), *Streptodictyon* cf. *soellingensis* (TEMBROCK), *Nassarius* cf. *intercisus* (MICHELOTTI), *Spirancilla indivisa* (KOCH et WIECHMANN), *Cordieria* sp., *Pleurofusia pseudosubtilis* (PEYROT), *Cochlespira* sp. Four species recorded in earlier papers need to be revisited: *Cypraeorbis hungarica* SCHILDER, *Cominella flurli* (GÜMBEL), *Turehua plexa* (WOLFF), *Eoconus* ex gr. *diversiformis* (DESHAYES). Four new species, *Pugilina katalinae* nov. sp., *Dorsanum strigoniense* nov. sp., *Sveltia nemethi* nov. sp. and *Merica krocki* nov. sp. have also been designated. (Abbreviation: shell length – SL, diameter – D in mm.)

Class Gastropoda COUVIER 1797
Superfamily Cypraeoidea RAFINESQUE, 1815
Family Cypraeidae RAFINESQUE, 1815
Genus *Cypraeorbis* CONRAD, 1865

Cypraeorbis hungarica SCHILDER, 1932
(Plate 2, figures 1–3)

1914 *Cypraea* (*Cavicypraea*) *globosa* DUJARDIN – TELEGDI-ROTH, p. 40 (non *C. globosa* DUJARDIN, 1837)
1932a *Cypraeorbis hungarica* – F. SCHILDER, p. 261 (new name for *C. globosa* TELEGDI-ROTH).
1932b *Cypraeorbis* (*Proadusta*) *hungarica* SCHILDER – F. SCHILDER, p. 124.
1971 *Cypraeorbis hungarica* SCHILDER – M. SCHILDER & F. SCHILDER, p. 122.

1973 *Zonaria globosa* DUJARDIN – BÁLDI, p. 279, pl. 34, figs 4, 6 (*cum syn.*)
1975 *Zonaria globosa* DUJARDIN – BÁLDI & STEININGER, pl. 3, fig. 1.
1992 *Zonaria* cf. *globosa* (DUJARDIN) – LEÉL-ŐSSY, pl. 5, figs 4–5.

Material: Four specimens.

Remarks: *Cypraeorbis hungarica* is the most frequent cypraeid species in the Egerian deposits of Hungary. It occurs at Eger, Diósjenő, Kesztölc and ?Dejtár. Unfortunately, the Eger specimens were misidentified as *Cypraea globosa* by TELEGDI-ROTH (1914), and the revisions of SCHILDER (1932a, 1932b) and SCHILDER & SCHILDER (1971) were overlooked in the subsequent literature. *Schilderia dujardini* SCHILDER, 1932 (new name for *Cypraea globosa* DUJARDIN, 1837, a primary homonym) was described from the Middle Miocene of France. *C. hungarica* differs from other Oligocene *Cypraeorbis* species of Europe in very globose outline, in absence of posterior terminal, and in strong columellar teeth, few in number (the type specimen had 11 denticles, the neotype has 13, and others have 13–17). Well-preserved Esztergom specimens show remnants of the original colour pattern: the base and the high callous — reaching halfway up to the dorsum — are brownish-cream, the mid-dorsal area is whitish with irregular sized and spaced dark brown dots. Given that TELEGDI-ROTH's original specimens are lost, a neotype is designated herein from Eger, the type locality. It can be found in the Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: M.63.3093. (representation: BÁLDI 1973, pl. 34, fig. 4).

Distribution: Egerian: Paratethys (Hungary).

Superfamily Muricoidea RAFINESQUE, 1815
Family Muricidae RAFINESQUE, 1815
Genus *Paziella* JOUSSEAUME, 1880

Paziella sp.
(Plate 2, figures 14–15, 17)

Material: 34 specimens.

Remarks: The closest form to our material is *Paziella aturensis* (COSSMANN et PEYROT, 1924) from the Chattian of France. Our specimens agree with the species in size, but differ in less inflated body whorl, in shorter and slightly reflected siphonal canal, and in sculpture by bearing only one spiral cord on the spire whorls. *Trophonopsis semperi* (KOENEN, 1872) and *T. angustevaricata* (GRIPP, 1912) from the Chattian of the North Sea Basin are similar in teleoconch features, but the protoconchs are higher and the sculptures are characterized by more projected spines. The Oligocene *Calotrophon* (*Panamurex*) *turbinelloides* (GRATELOUP, 1833) possesses a wider aperture and stronger sculpture. Considering the morphology of the Esztergom specimens, as well as the summary of the genus (MERLE et al. 2011) our material probably represents a new *Paziella* species.

Family Volutidae RAFINESQUE, 1815
Genus *Volutilithes* SWAINSON, 1831

Volutilithes cf. *apenninica* (MICHELOTTI, 1861)
(Plate 2, figure 16)

1861 *Voluta Apenninica* – MICHELOTTI, p. 99, pl. 10, figs 20–21.
1890 *Volutilithes apenninica* (MICHELOTTI) – BELLARDI & SACCO, p. 11, pl. 1, fig. 10.
1900 *Volutilithes appenninica* (MICHELOTTI) – ROVERETO, p. 174, pl. 8, fig. 14.
? 1937 *Volutilithes appenninica* (MICHELOTTI) – VENZO, p. 36, pl. 2, fig. 21 (*cum syn.*)
1991 *Volutocorbis* (*Volutocorbis*) *apenninica* (MICHELOTTI) – BONCI et al., p. 154, pl. 2, fig. 5.

Material: 337 specimens.

Remarks: The Esztergom specimens are close to the type in teleoconch features, but slightly differs in broader spire. The species differs from *Volutocorbis subambigua* (D'ORBIGNY, 1852) [= *V. multicostata* BELLARDI, 1890] in obtuse angled sutural ramp, and in sculpture with finer axial ribs and dense spiral cords, as well as from *Volutilithes proxima* SACCO, 1890 in development of the ramp, and in spiral sculpture. *V. permulticostata* TELEGDI-ROTH, 1914 possesses a smaller shell with dense, fine axial ribs and spiral grooves. *V.* cf. *apenninica* is relatively frequent in the whole assemblage, representing 8.2%.

Distribution: Late Oligocene: N Tethys (N Italy), Paratethys (Hungary).

Superfamily Buccinoidea RAFINESQUE, 1815
Family Melongenidae GILL, 1871
Genus *Pugilina* SCHUMACHER, 1817

Pugilina katalinae nov. sp.
(Plate 3, figures 1, 2–3, 4–5)

1984a Melongenidae sp. – JANSSEN, A., p. 130, pl. 4, figs 2–3 *only*

Material: 85 specimens.

Holotype: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.10. (Plate 3, figures 2–3).

Paratypes – 1st and 2nd paratypes: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.11.–PAL 2016.12. (Plate 3, figures 1, 4–5), 3rd, 4th and 5th paratypes: private collection of Z. VICIÁN (Budapest, Hungary).

Type strata: Egerian clayey siltstone.

Type locality: Esztergom, Hungary.

Derivation of name: In honour of Katalin TÓTH, Hungarian fossil collector (Budapest, Hungary).

Diagnosis: Medium-sized shell, protoconch of two whorls, teleoconch of four whorls, broad and spined axial ribs, well-developed spiral cords, sutural ramp with foliaceous layers, outer lip lirate within, smooth columella, prominent fasciole, small pseudoumbilicus.

Measurements (mm)	SL	D
holotype (PAL 2016.10.)	45	26
1st paratype (PAL 2016.11.)	53	32
2nd paratype (PAL 2016.12.)	56	35

Table 1. List of gastropods from four units of the Esztergom section with numbers of specimens. [Revised species of BÁLDI 1973 in square brackets.]
1. táblázat. *Az esztergomi feltárás négy rétegének gastropodafaunája példányszámokkal. [BÁLDI 1973 faunájának revideált fajai szögletes zárójelben.]*

Gastropoda		Unit			
Family	species	E	D2	C	B1
Melanopsidae	*Melanopsis hantkeni* Hofmann, 1870 (Plate 1, figs 3-4)			2	
Batillariidae	*Granulolabium plicatum* (Bruguière, 1792) (Plate 1, fig. 5)	13	1	22	3
Potamididae	*Tympanotonos margaritaceus* (Brocchi, 1814) (Plate 1, fig. 6)	13		25	4
	Terebralia lignitarium (Eichwald, 1830) [= *T. bidentata* (Defrance)]			1	
Cerithiidae	*Cerithium egerense* Gábor, 1936 (Plate 1, fig. 8)	1		3	
Plesiotrochidae	?*Plesiotrochus* sp. (Plate 1, fig. 9)			1	
Diastomatidae	*Diastoma elongata* Brongniart, 1823 (Plate 1, fig. 7) [= *D. grateloupi turritoapenninica* Sacco]	34	11	452	17
Turritellidae	*Protoma cathedralis* (Brongniart, 1823)			1	
	Haustator venus d'Orbigny, 1852 (Plate 1, fig. 10)	61	7	336	56
	Haustator turris Basterot, 1825 (Plate 1, fig. 11)	5		9	8
	Haustator cf. *asperula* (Brongniart, 1823)			2	
	Turritella cf. *incisa* Brongniart, 1823			1	
Aporrhaidae	*Aporrhais callosa* Telegdi-Roth, 1914 (Plate 1, fig. 13)	28		38	7
	Drepanocheilus speciosus (Schlotheim, 1820) (Plate 1, fig. 12)	6		51	1
Xenophoridae	*Xenophora* sp.			5	
Strombidae	*Persististrombus praecedens* (Schaffer, 1912) [*Strombus coronatus* Defrance]			2	
Ampullinidae	*Globularia gibberosa* Grateloup, 1847	2		7	
	Globularia sanctistephani (Cossmann et Peyrot, 1919) (Plate 1, fig. 14-15)	12	1	86	4
	Ampullinopsis crassatina (Lamarck, 1804) (Plate 1, fig. 16)	11	1	12	3
Naticidae	*Neverita olla* (De Serres, 1829)	2			
Cypraeidae	*Cypraeorbis hungarica* Schilder, 1932 (Plate 2, figs 1-3)			4	
	Cypraeorbis cf. *turgidiuscula* Gregorio, 1894 [= *Zonaria subexcisa* Braun]			2	
Tonnidae	*Cassidaria megacephala* (Philippi, 1843) [= *C. nodosa* (Solander)]			5	
	Cassidaria depressa Buch, 1831 (Plate 2, fig. 4)			3	
Ranellidae	*Sassia turrita* (Eichwald, 1830) (Plate 2, fig. 5) [= *Charonia* (*Sassia*) *tarbelliana transiens* Báldi 1973]	1		6	
Ficidae	*Ficus conditus* (Brongniart, 1823)			4	
Eulimidae	*Eulima glabra hebe* Semper, 1861			1	
Muricidae	*Crassimurex* (*Eopaziella*) *deshayesi* (Nyst, 1836) (Plate 2, figs 6-7)	2		63	1
	Crassimurex (Eopaziella) capito (Philippi, 1843) (Plate 2, fig. 8)			2	
	Typhis pungens (Solander, 1766) (Plate 2, fig. 9)	10	1	24	5
	Lyrotyphis cuniculosus (Nyst, 1836) (Plate 2, fig. 10)	3		6	1
	Chicoreus (*Triplex*) *trigonalis* (Gábor, 1936) (Plate 2, figs 11-13)	1		2	
	Paziella sp. (Plate 2, figs 14-15, 17)	2		30	2
Volutidae	*Volutilithes* cf. *apenninica* (Michelotti, 1861) (Plate 2, fig. 16)	25	1	296	15
	Lyria gardonyii Noszky, 1936			2	
Melongenidae	*Melongena basilica* (Bellardi, 1872) (Plate 2, fig. 18)	5		6	
	Pugilina katalinae nov. sp. (Plate 3, figs 1-5)	54		19	12
Buccinidae	*Babylonia eburnoides* (Mathéron, 1842) (Plate 3, figs 6-7)	26	1	99	9
	Cominella flurli (Gümbel, 1861) [= *B. hungarica* (Gábor)] (Plate 3, fig. 20)	3		14	4
	Scalaspira elegantula (Philippi, 1843) (Plate 3, figs 9-10)	2		18	
	Parvisipho scrobiculatus (Boll, 1851) (Plate 3, figs 11-13)			5	
Fasciolariidae	*Euthriofusus szontaghi* Noszky, 1936 (Plate 3, fig. 8)			2	
	Pseudolatirus mayeri (Bellardi, 1872) (Plate 3, figs 14-16)	7	2	235	6
	Streptodictyon cf. *soellingensis* (Tembrock, 1965) (Plate 3, figs 17-18)	3		2	2
	Streptodictyon cf. *subelongatus* (d'Orbigny, 1852) (Plate 3, fig. 19)			1	
Nassariidae	*Nassarius* cf. *intercisus* (Michelotti, 1840) (Plate 3, figs 21-23)	18		297	8
	Nassarius hevesensis (Báldi, 1966) (Plate 4, figs 1-2)			3	
	Nassarius fortecostatus (Hölzl, 1958) (Plate 4, figs 7-8)	1		2	
	Nassarius sp. A (Plate 4, figs 9-10)			1	
	Nassarius sp. B (Plate 4, figs 3-4)			4	1
	Nassarius sp. C (Plate 4, figs 5-6)			4	2
	Nassarius sp.	3		5	6
	Dorsanum strigoniense nov. sp. (Plate 4, figs 11-16)	26	2	656	5
Marginellidae	*Marginella vadaszi* Báldi, 1961 (Plate 4, figs 17-20)			21	
Olividae	*Spirancilla indivisa* (Koch et Wiechmann, 1872) (Plate 4, figs 21-22)			12	
Cancellariidae	*Merica krocki* nov. sp. (Plate 5, figs 1-2, 5-6)			1	1
	Bonellitia evulsa postera (Beyrich, 1856)			8	
	Turehua plexa (Wolff, 1897) (Plate 5, figs 7-8)			3	
Conidae	*Eoconus* ex gr. *diversiformis* (Deshayes, 1824) (Plate 4, figs 23-24)			15	
Borsoniidae	*Cordieria* sp. (Plate 5, figs 3-4)			42	
	Bathytoma cataphracta (Brocchi, 1814) (Plate 5, fig. 9)	2		25	1
Raphitomidae	*Raphitoma valdecarinata* Báldi, 1966 (Plate 5, figs 10-11)	1		6	
Drilliidae	*Pleurofusia pseudosubtilis* (Peyrot, 1931)(Plate 5, figs 12-14)	3		22	1
Cochlespiridae	*Cochlespira* sp. (Plate 5, fig. 15)			1	
Turridae	*Orthosurcula* ex gr. *regularis* (Koninck, 1837) (Plate 5, figs 16-17)	55	5	323	20
	Domenginella ilonae (Báldi, 1966) (Plate 5, fig. 18)			2	
	Fusiturris duchasteli (Nyst, 1843) (Plate 5, fig. 19)	2		3	4
	Fusiturris duchasteli flexiplicata (Kautsky, 1925)		1	2	
	Gemmula laticlavia (Beyrich, 1848) (Plate 5, fig. 21)	2	1	19	5
	Polystira konincki (Nyst, 1843) (Plate 5, fig. 20)	2		27	1
Pyramidellidae	*Turbonilla* sp.			1	

3rd paratype	45	28
4th paratype	40	25

Description: Protoconch of about two tuberculate whorls, junction with teleoconch delimited by fine curved groove and appearance of spiral cords. Teleoconch of four whorls angulate at the shoulder, with foliaceous periphery at abapical suture, outline step-like. Sutural ramp broad and sloping, convex on the spire, concave on the body whorl where foliaceous layers appear formed by projected growth lines. Axial sculpture of broad, rounded, orthocline ribs becoming spined on the body whorl. Spiral sculpture of numerous, irregular narrow cords. Last whorl of the holotype bears 8 axial ribs and 35 stronger or finer cords. On some specimens the spiral cords and the growth lines form a reticulate sculpture on the sutural ramp. Aperture pyriform, outer lip simple and lirate within, columella smooth. Fasciole prominent and blunt, surrounding small pseudoumbilicus.

Remarks: The new species is assigned to genus *Pugilina* as the morphology corresponds to the diagnosis of the taxon (high spire, absence of both adapical notch and second row of spines, lirate outer lip internally) (see LANDAU & VERMEIJ 2013). The most closely allied taxon is *P. aequalis lathyroides* NOSZKY, 1936 from Eger. It seems remarkably similar in sculpture and development of the fasciole with pseudoumbilicus, but it differs in the outline of the spire and absence of spines. Unfortunately, an adequate comparison cannot be achieved as NOSZKY's type specimen was destroyed. *P. polygonata* (BRONGNIART, 1823) is also a close form, but lacks spined axial ribs and irregular foliaceous ornamentation (see LOZOUET & MAESTRATI 2012 and LOZOUET et al. 2012). *P. aequalis* (MICHELOTTI, 1861) possesses a narrower shell with a rounded shoulder. Two Melongenidae specimens recorded by JANSSEN, A. (1984a) seems conspecific with *P. katalinae* nov. sp. The taxon is widely distributed in the Egerian localities of Hungary. Besides Esztergom and Máriahalom, it also occurs at Eger (T. NÉMETH's private collection) and Kesztölc. *P. katalinae* nov. sp. is relatively abundant in Unit E of the Esztergom section, representing a 12% presence.

Family Buccinidae, RAFINESQUE, 1815
Genus *Scalaspira* CONRAD, 1862

Scalaspira elegantula (PHILIPPI, 1843)
(Plate 3, figures 9–10)

1843 *Fusus elegantulus* n. sp. – PHILIPPI, p. 59, 76, pl. 4, fig. 16.
1968 *Scalaspira* (*Scalaspira*) *elegantula elegantula* (PHILIPPI) – TEMBROCK, p. 216, pl. 1, figs 2–5, pl. 3, figs 2–7, pl. 5, figs 6–7, pl. 6, fig. 7, pl. 7, fig. 11 (*cum syn.*)
1979 *Scalaspira* (*Scalaspira*) *elegantula elegantula* (PHILIPPI) – JANSSEN, R., p. 286, pl. 15, fig. 7 (*cum syn.*)
1998 *Scalaspira* (*Scalaspira*) *elegantula* (PHILIPPI) – WELLE, p. 44, pl. 7, figs 6–11, pl. 24, fig. 3 (*cum syn.*)

Material: 20 specimens.

Remarks: The species is characterized by an extreme morphological variability. The ornamentation of our specimens is slightly weaker than that of the type, but it can be interpreted as an intraspecific variation. The taxon is the index of the Chattian Chattian *Scalaspira elegantula* Zone in the North Sea Basin gastropod biostratigraphy.

Distribution: Chattian: North Sea Basin, Mainz Basin (Germany, Belgium, Denmark), Egerian: Paratethys (Hungary).

Genus *Parvisipho* COSSMANN, 1899

Parvisipho scrobiculatus (BOLL, 1851)
(Plate 3, figures 11–12, 13)

1851 *Fusus scrobiculatus* – BOLL, p. 457.
1952 *Streptochetus scrobiculatus* (BOLL) – GÖRGES, p. 92, pl. 2, fig. 67.
1958 *Streptochetus scrobiculatus* (BOLL) – SENEŠ, p. 157.
1979 *Parvisipho* (s. lat.) *scrobiculatus* (BOLL) – JANSSEN, R., p. 293, pl. 16, fig. 19 (*cum syn.*)
1997 *Parvisipho scrobiculatus* (BOLL) – MOTHS et al., p. 8, pl. 5, fig. 1.
1998 *Parvisipho* (s. lat.) *scrobiculatus* (BOLL) – WELLE, p. 47, pl. 8, fig. 1, pl. 24, fig. 5 (*cum syn.*)

Material: Five specimens.

Remarks: The shell morphology of this Boreal species resembles that of *Mitra scrobiculata* BROCCHI, 1804 but differs in size, in less convex whorls, and in absence of columellar folds.

Distribution: Chattian: North Sea Basin (N Germany, Belgium), Egerian: Paratethys (Slovakia, Hungary).

Genus *Cominella* GRAY, 1850

Cominella flurli (GÜMBEL, 1861)
(Plate 3, figure 20)

1861 *Buccinum Flurli* – GÜMBEL, p. 755.
1897 *Buccinum Flurli* GÜMBEL – WOLFF, p. 276, pl. 26, fig. 22 *only*
1936 *Cominella* (=*Buccinum*) *hungarica* n. sp. – GÁBOR, p. 3, pl. 1, fig. 4.
1936 *Cominella* cfr. *Flurli* GÜMB. – NOSZKY, p. 67.
1958 *Northia* (*Cominella*) *flurli* (GÜMB.) – SENEŠ, p. 153.
1963 *Cominella flurli hungarica* GÁBOR – BÁLDI, p. 91, pl. 6, fig. 13.
1973 *Bullia hungarica* (GÁBOR) – BÁLDI, p. 297, pl. 39, figs 4–6 (*cum syn.*)
? 2001 *Bullia hungarica* (GÁBOR) – HARZHAUSER & MANDIC, p. 712, pl. 2, fig. 4 (*cum syn.*)

Material: 21 specimens.

Remarks: The close affinity between *Cominella flurli* and *Cominella hungarica* was pointed out earlier by the author (GÁBOR 1936), and later emphasized again by BÁLDI (1963, 1973). HARZHAUSER & MANDIC (2001) have recently questioned the validity of GÁBOR's taxon. Based on morphological similarity, *C. hungarica* is regarded here as a junior synonym of *C. flurli*.

Distribution: Egerian: Paratethys (S Germany, Hungary, S Slovakia, Croatia, Romania).

Family Fasciolariidae GRAY, 1853
Genus *Pseudolatirus* BELLARDI, 1884

Pseudolatirus mayeri (BELLARDI, 1872) (Plate 3, figures 14–15, 16)

1872 *Fusus Mayeri* – BELLARDI, p. 142, pl. 9, fig. 15.
1937 *Fusus* (*Aptyxis*) *Mayeri* BELLARDI – VENZO, p. 21, pl. 1, fig. 14.

Material: 250 specimens.

Remarks: These specimens possess a multispiral, conical, smooth protoconch of 2.5 whorls, a fusiform teleoconch of 6 rounded whorls, a sculpture of broad axial ribs and fine spiral threads, and a long siphonal canal. The overall morphology, especially the alternating fine, broader and narrower spiral threads, is closely related to that of *P. mayeri*. Based on the morphological analysis of some *Pseudolatirus* species by LOZOUET (2015), BELLARDI's taxon is herein classified as being within genus *Pseudolatirus P. raulini* (PEYROT, 1928) was recorded from Eger by NOSZKY (1936), and it has a similar form, but differs in sculpture by bearing several axial ribs on the spire and more prominent spiral cords. *P. mayeri* is relatively abundant in the Esztergom assemblage, representing 6% of the whole material.

Distribution: Late Oligocene: N Tethys (N Italy), Paratethys (Hungary).

Genus *Streptodictyon* TEMBROCK, 1961

Streptodictyon cf. *soellingensis* (TEMBROCK, 1965) (Plate 3, figures 17, 18)

1965 *Streptochetus* (*Streptolathyrus*) *soellingensis* – TEMBROCK, p. 430, fig. 1.
1979 *Streptochetus* (*Streptolathyrus*) *soellingensis* TEMBROCK – JANSSEN, R., p. 298, pl. 16, figs 29–30 *only*
1994 *Streptodictyon soellingensis* (TEMBROCK) – CADÉE & JANSSEN, A., p. 62, text-figs 17–18, pl. 4, figs 2–4 (*cum syn.*)
1997 *Streptochetus* (*Streptolathyrus*) *soellingensis* TEMBROCK – GRÜNDEL, p. 15, pl. 3, fig. 10.
1998 *Streptochetus* (*Streptolathyrus*) *soellingensis* TEMBROCK – WELLE, p. 55, pl. 9, fig. 4 (*cum syn.*)
2008 *Streptodictyon soellingensis* (TEMBROCK) – SCHNETLER & PALM, p. 42, pl. 6, figs 5–6, pl. 9, figs 2–3 (*cum syn.*)

Material: Seven specimens.

Remarks: The genus was recorded from the Paratethys by BÁLDI (1973), and the Esztergom assemblage confirms the sporadic presence of this Boreal representative. The Esztergom specimens agree with the type of *S. soellingensis* in shell morphology, however, they possess an inner lip lirate within. The species differs from the closely related *S. undatus* (MEUNIER, 1880) in fine spiral lirae on the protoconch and in slightly longer siphonal canal. The fragmentary *Streptochetus elongatus* specimens figured by BÁLDI (1973, pl. 42, fig. 5, pl. 43, fig. 3) are revisited and considered herein as *Streptodictyon* cf. *subelongatus* (D'ORBIGNY, 1852) (Plate 3, figure 19).

Distribution: Genus *Streptodictyon* ranges in the Late Oligocene of the North Sea Basin and the Paratethys (Mainz Basin, S. Germany, ?Slovakia), *S. soellingensis* is known from N Germany and Denmark.

Family Nassariidae IREDALE, 1916

Genus *Nassarius* DUMÉRIL, 1806

Remarks: The diversity of the genus is higher in the Esztergom assemblage than in other materials known from the Paratethys. As the collection of NOSZKY (1936) was destroyed, his numerous "*Nassa*" taxa cannot be revisited. Only three species were recorded by BÁLDI (1973) which represent the genus: *N. hevesensis* (BÁLDI), *N. fortecostatus* (HÖLZL) (= *Hinia fortecostata edentata* BÁLDI), and *N. schlotheimi* (BEYRICH). The assemblage presented here contains the first two (Plate 4, figs 1–2, 7–8), but the latter, which is a widely distributed and frequent index taxon, is absent. On the other hand, at least four previously unknown species occur in the material. Three rare forms are figured herein, albeit without species level determination (*Nassarius* sp. A, B, C, see Plate 4), while an abundant species is described as *N.* cf. *intercisus* (MICHELOTTI).

Nassarius cf. *intercisus* (MICHELOTTI, 1840) (Plate 3, figures 21, 22–23)

1840 *Buccinum intercisum* GENÉ – MICHELOTTI, p. 161.
1882 *Nassa intercisa* (GENÉ) – BELLARDI, p. 59, pl. 4, figs 4–8.
1882 *Nassa angusta* BELLARDI – BELLARDI, p. 61, pl. 4, fig. 9.
1904 *Nassa* (*Uzita*) *intercisa* (GENÉ) – SACCO, p. 65, pl. 15, figs 48–50.
1981 *Nassa intercisa* (MICHELOTTI, GENÉ m.s.) – FERRERO MORTARA et al., pl. 23, fig. 6.
2009 *Nassarius intercisus* (MICHELOTTI) – ZUNINO & PAVIA, p. 362.

Material: 323 specimens.

Remarks: The teleoconch features of the specimens, especially the sculpture with slightly flexuous axial ribs resemble those of the specimens figured by WOLFF (1897, pl. 26, figs 17–18) as *Buccinum gümbelinum* (MAYER-EYMAR, 1861). *B. gümbelinum* was emended as *Nassa lineolata* GRATELOUP, 1834 by HÖLZL (1958), and it was later assigned to genus *Dorsanum* by LOZOUET & GALINDO (2015). The *lineolatus* specimen of PEYROT (1925, pl. 2, figs 50–52) has a lower protoconch, and ridges are present on the inside of outer lip, while other specimens possess a higher teleoconch with 6–7 whorls (PEYROT 1925, pl. 3, figs 11–12, LOZOUET & GALINDO 2015, pl. 4, figs 4–9). As apertures of the Bavarian specimens are unknown, the material presented here is classified as *N. intercisus*. This species is affiliated with *D. lineolatum* (see BENOIST 1885) but characterized by a smooth outer lip within, so they do not seem to be conspecific. Our material with its slightly convex whorls agrees with the teleoconch features of the type (BELLARDI 1882, pl. 4, fig. 4) but differs slightly in somewhat stronger spiral threads. SACCO's specimen (1904, pl. 15, fig. 48) bears more convex whorls.

Distribution: *D. lineolatum*: Aquitanian–Burdigalian of France and S Germany. *N. intercisus*: Burdigalian of N Italy, —the Esztergom material confirms an extended stratigraphical and paleogeographical range. *Nassa flexuosa gümbelina* was described from the Egerian of Kováčov, S Slovakia; *Hinia* cf. *lineolata* was recorded from the Lower Miocene of Törökbálint, Hungary.

Genus *Dorsanum* GRAY, 1847

Dorsanum strigoniense nov. sp.
(Plate 4, figures 11–13, 14–15, 16)

Material: 689 specimens.

Holotype: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.1. (Plate 4, figures 11–13).

Paratypes: 1st, 2nd, 3rd, and 4th paratypes: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.2.–PAL 2016.5., 5th, 6th and 7th paratypes: private collection of Z. VICIÁN (Budapest, Hungary).

Type strata: Egerian (Late Oligocene – Early Miocene) clayey siltstone.

Type locality: Esztergom, Hungary.

Derivation of name: Refers to the type locality from the Latin name of Esztergom (Strigonium).

Diagnosis: Medium-sized, gradate shell, smooth protoconch of 2.5 whorls, five convex teleoconch whorls, strong axial ribs, spiral threads, smooth lips, oval aperture, small siphonal notch.

Measurements (mm)	SL	D
holotype (PAL 2016.1.)	16	8
1st paratype (PAL 2016.2.)	16.5	8.5
2nd paratype (PAL 2016.3.)	14	8
3rd paratype (PAL 2016.4.)	16	8
4th paratype (PAL 2016.5.)	15	8

Description: Slightly conical, smooth protoconch of 2.5 convex whorls. Spire of four convex, gradate whorls, last whorl also convex. Sculpture of strong, widely spaced, slightly sigmoid axial ribs and numerous fine spiral lirae. Axial ribs slightly projected on the shoulder then depressed on the sutural ramps, so two rows of low nodes appear along the upper suture, similarly to that of genus *Duplicata.* Last whorls of adult shells bear ten axial ribs. Spiral threads somewhat stronger and widely spaced at the base. Aperture ovate, columella moderately broad, columellar callus somewhat thickened, siphonal notch small. Lips smooth, outer lip thick.

Remarks: Based on the sculpture and on the absence of the *Cyllenina*-band, the new species is placed within genus *Dorsanum*. *D. ruidum* PEYROT, 1926 from the Late Oligocene – Early Miocene of France is a closely allied taxon, but is characterized by a lower body whorl with much coarser axial ribs. Two *D.* cfr. *ruidum* specimens were recorded by NOSZKY (1936) from Eger and their very strong ribbing was emphasized. Presumably they represented *D. strigoniense* nov. sp., however, they cannot be traced because NOSZKY's collection was destroyed. *D. laticosta* (SANDBERGER, 1863), which occurs around the Chattian–Aquitanian boundary of the Mainz Basin is also a closely related form, but possesses lower spiral whorls with somewhat denser axial ribs (see SCHÄFER & KADOLSKY 2015, pl. 4, fig. 6). *D. strigoniense* nov. sp. forms a remarkably high proportion (16.7%) in the whole Esztergom assemblage.

Superfamily Olivoidea LATREILLE, 1825
Family Olividae LATREILLE, 1825
Genus *Spirancilla* VOKES, 1935

Spirancilla indivisa (KOCH et WIECHMANN, 1872)
(Plate 4, figures 21–22)

1872 *Ancillaria indivisa* KOCH et WIECHMANN – KOCH & WIECHMANN, p. 44, pl. 2, fig. 1.
1979 *Ancilla* (*Ancillus*) *indivisa* (KOCH et WIECHMANN) – JANSSEN, R., p. 303, pl. 16, fig. 35.
1992 *Ancillus indivisus* (KOCH et WIECHMANN) – LOZOUET, pl. 2, figs 8–9.
1998 *Ancillus indivisus* (KOCH et WIECHMANN) – WELLE, p. 58, pl. 9, fig. 11 (*cum syn.*)

Material: 12 specimens.

Remarks: The species is characterized by seven lirae on the columellar band, and a narrow and relatively deep furrow that separates the wall and the columella. The shell of *Spirancilla karsteni* (BEYRICH, 1853) is somewhat broader with a lower and wider aperture.

Distribution: Chattian: North Sea Basin (N Germany, Belgium), Egerian: Paratethys (Hungary).

Superfamily Cancellarioidea FORBES et HANLEY, 1851
Family Cancellariidae FORBES et HANLEY, 1851
Genus *Sveltia* JOUSSEAUME, 1887

Sveltia nemethi nov. sp.
(Plate 4, figures 25–26)

Material: One specimen.

Holotype: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.15. (SL: 22, D: 8.5) (Plate 4, figures 25–26).

Type strata: Egerian (Late Oligocene – Early Miocene) clayey siltstone.

Type locality: Esztergom, Hungary.

Derivation of name: In honour of Tamás NÉMETH, Hungarian fossil collector (Balatonkenese, Hungary).

Diagnosis: Elevated shell, smooth protoconch of 1.5 whorls, five rounded teleoconch whorls, raised axial ribs, fine spiral lirae, ovate aperture, two columellar folds.

Description: Slender, elevated shell, smooth protoconch of 1.5 whorls. Spire of four slightly rounded, non-angulate whorls, body whorl rounded. Sculpture of widely spaced, raised axial ribs and fine spiral lirae. Two ribs on the

penultimate whorl, and the last six ribs on the body whorl are varix-like and forward curved. The body whorl bears 9 slightly sigmoid axial ribs and 18 spiral lirae. Subsutural band smooth. Aperture ovate, columella with two developed, oblique folds.

Remarks: The new species differs from *S. varicosa miocenica* (DODERLEIN, 1862) that was recorded by NOSZKY (1936) from Eger and it has a higher spire. The Miocene *S. dertovaricosa* SACCO, 1894 is similar in development of the protoconch, but its whorls are subangulate, and it bears three columellar folds. *S. paucicostata* PEYROT, 1928 specimens from the Early Miocene of the North Sea Basin possess subrounded teleoconch whorls (JANSSEN, A. 1984b), but differ in higher protoconch, in broader shell with deeply incised suture, and in sculpture with more prominent varices. The poorly preserved cancellariid specimen described by BÁLDI (1973, p. 308, pl. 45, fig. 5) as *Uxia granulata* [non *Unitas granulata* (NYST, 1845)] bears a lower spire, straight axial ribs and a narrow aperture.

Genus *Merica* H. et A. ADAMS, 1854

Merica krocki nov. sp.
(Plate 5, figures 1–2, 5–6)

Material: Two specimens.

Holotype: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.13. (SL: 23, D: 12.5) (Plate 5, figures 1–2).

Paratype: Hungarian Natural History Museum, Department of Palaeontology and Geology; inventory number: PAL 2016.14. (SL: 18, D: 10) (Plate 5, figures 5–6).

Type strata – Egerian (Late Oligocene – Early Miocene) clayey siltstone.

Type locality: Esztergom, Hungary.

Derivation of name: In honour of Helmut KROCK, German fossil collector (Lüneburg, Germany).

Diagnosis: Medium-sized, elongate-ovate shell, smooth multispiral protoconch, small nucleus, three convex teleoconch whorls, strong axial ribs, finer spiral cords, ovate aperture, outer lip lirate within, three oblique columellar folds.

Description: Conical, smooth protoconch of 2.5 slightly convex whorls, junction with teleoconch delimited by an orthocline scar. Conical spire of two slightly convex, gradate whorls, body whorl convex, suture impressed. Axial sculpture of slightly sigmoid prosocline ribs, becoming more prominent on the last whorl. Varices absent. Spiral sculpture of broad cords alternating with two fine cords, overriding the axial sculpture. The body whorl of the holotype bears 15 axial ribs and 14 broad spiral cords. Aperture ovate, the broken outer lip of the holotype thin and lirate within. Columella with three weakly developed, oblique folds, the abapical fold demarcates the margin of the canal. The paratype bears a shallow pseudoumbilicus.

Remarks: The specimens are close in overall shell morphology to Recent *Merica melanostoma* (SOWERBY, 1849), the type species, and to Recent *M. oblonga* (SOWERBY, 1825), therefore, the new species is placed within genus *Merica*. *M. neglecta* (MICHELOTTI, 1861) from the Oligocene of N Italy is characterized by a more elongate shell. *M. bronni* (BELLARDI, 1841) from the Lower Miocene of N Italy and S France has a similar slender shell and a high protoconch, but differs in reticulate sculpture. *Bonellitia evulsa miolonga* SACCO, 1894 possesses an elevated protoconch, but it bears varices. *Contortia* species are closely related to *Merica*, but differ mainly in much stronger sculpture (CAHUZAC et al. 2004). *Coptostoma quadrata* (SOWERBY, 1822) differs in paucispiral protoconch, broader spire with sutural ramp, and narrower aperture with oblique syphonal canal. *M. krocki* nov. sp. occurs sporadically in the Egerian deposits of Eger as well (T. NÉMETH'S private collection).

Genus *Turehua* MARWICK, 1943

Turehua plexa (WOLFF, 1897)
(Plate 5, figures 7–8)

1897 *Fusus* (*Fasciolaria*?) *plexus* – WOLFF, p. 282, pl. 26, fig. 9, pl. 27, fig. 4.
1914 *Fasciolaria plexa* WOLFF – TELEGDI-ROTH, p. 15, pl. 1, figs 13–15.
1958 *Fasciolaria* (*Pleuroploca*) *plexa* (WOLFF) – HÖLZL, p. 248, pl. 21, fig. 4.
1973 *Fasciolaria plexa* (WOLFF) – BÁLDI, p. 301, pl. 42, fig. 8 (*cum syn.*)
? 1998 ?*Turehua* sp. – WELLE, p. 69, pl. 11, fig. 12.
2001 *Fasciolaria*? *plexa* (WOLFF) – HARZHAUSER & MANDIC, p. 711, pl. 2, fig. 6 (*cum syn.*)

Material: Three specimens.

Remarks: The poor state of preservation of the specimens recorded in the literature allows no accurate arrangement of this rare taxon. Although our specimens are also fragments, based on their sculpture and the presence of columellar folds the classification of PETIT & HARASEWYCH (2005) is accepted here and the species is placed within genus *Turehua*. The morphology of the ?*Turehua* specimen figured by WELLE (1998) seems to agree well with that of *T. plexa*.

Distribution: Egerian to Eggenburgian: Paratethys (S Germany, Austria, Hungary). Its presence in the Upper Oligocene of the North Sea Basin requires further research.

Superfamily Conoidea FLEMING, 1822
Family Conidae FLEMING, 1822
Genus *Eoconus* TUCKER et TENORIO 2009

Eoconus ex gr. *diversiformis* (DESHAYES, 1824)
(Plate 4, figures 23–24)

1824 *Conus diversiformis* – DESHAYES, p. 747, pl. 93, figs 9–12.
? 1936 *Conus* (*Leptoconus*) *Dujardini* DESH. nov. var. *brevispiratus* – NOSZKY, p. 110, pl. 5, fig. 13.
1986 *Lithoconus ineditus* MICHELOTTI – BÁLDI, p. 86, pl. 11, figs 130–131.
2004 *Conus diversiformis* DESHAYES – HARZHAUSER, p. 142, pl. 16, figs 6–7 (*cum syn.*)

Material: 15 specimens.

Remarks: With respect to generic classification, the present study follows TUCKER & TENORIO (2009). This polymorph species has recently been discussed by HARZHAUSER (2004). The controversial relationship between *E. diversiformis* and "*Conus*" *grateloupi* D'ORBIGNY, 1852 was dealt with by BONCI et al. (1991) and HARZHAUSER (2007). "*Conus*" *semperi* SPEYER, 1862 from the Chattian of the North Sea Basin, is also a closely allied form in its morphological and stratigraphical range, however, its relation to the *diversiformis–grateloupi* group requires further research. The low spire of *brevispiratus* NOSZKY resembles that of *E. diversiformis*, but NOSZKY (1936) did not mention the surface of the spiral whorls. As the type specimen was destroyed the arrangement of *brevispiratus* requires further collecting work in the vicinity of Eger.

Distribution: Eocene–Oligocene: Europe, C. Asia. Oligocene: E Atlantic province (France), N Tethys (N Italy, Bulgaria, Greece), Paratethys (Hungary, Romania), NE Tethys (Iran).

Family Borsoniidae BELLARDI, 1875
Genus *Cordieria* ROUAULT, 1848

Cordieria sp.
(Plate 5, figures 3–4)

Material: 42 specimens.

Remarks: The specimens possess convex whorls, broad and oblique axial ribs, and two weakly developed columellar folds. The most closely allied species is *Cordieria plicata* (BEYRICH, 1848) which is characterized by the remarkable variability of its sculpture (GÖRGES 1952, JANSSEN, R. 1979, WELLE 1998). However, *C. plicata* bears a quite developed subsutural depression. The latter feature is not present on our specimens, similarly to some Eocene *Cordieria* taxa (e.g. *C. dumasi* COSSMANN, 1896). *C. plicata* is known from the Oligocene of the North Sea Basin (Germany, Denmark), and the Eastern Paratethys (Caspian region).

Family Drilliidae OLSSON, 1964
Genus *Pleurofusia* DE GREGORIO, 1890

Pleurofusia pseudosubtilis (PEYROT, 1931)
(Plate 5, figures 12–13, 14)

1931 *Surcula pseudosubtilis* nov. sp. – PEYROT, p. 68, pl. 9, figs 88–89.
2015 *Pleurofusia pseudosubtilis* (PEYROT) – LOZOUET, p. 40 (*pars*), text-fig. 1/4, pl. 17, figs 12–13.

Material: 26 specimens.

Remarks: The specimens have a paucispiral protoconch, seven teleoconch whorls, a concave sutural ramp, an axial sculpture of broad, slightly opisthocline ribs, a spiral sculpture of widely spaced, sharp spiral cords, and numerous fine threads between the cords. The morphology agrees well with that of *P. pseudosubtilis*, but differs slightly in more prominent axial ribs. These ribs resemble the sculpture of the high-spired *P. paulensis* LOZOUET, 2015. This difference is interpreted herein as an intraspecific variation. The shell features of *P. leganyii* (BÁLDI, 1966) from the Oligocene of the Paratethys are similar, but this species has a broader body whorl and stronger spiral cords.

Distribution: Chattian: E Atlantic province (S France), Egerian: Paratethys (Hungary).

Family Cochlespiridae POWELL, 1942
Genus *Cochlespira* CONRAD, 1865

Cochlespira sp.
(Plate 5, figure 15)

Material: One specimen.

Remarks: The specimen possesses a conical, smooth protoconch of 2 whorls, seven teleoconch whorls with a sharp, finely tuberculate midheight keel, as well as short, oblique ridges on the upper part of the growth lines below the suture, and widely spaced rows of small tubercles on the body whorl. *Cochlespira perspirata* (KOENEN, 1865) is a closely related species in teleoconch features, but differs in ornamentation with smooth sutural band and non-beaded secondary spirals on the base. *C. volgeri* (PHILIPPI, 1847) possesses higher keels and markedly reduced ornamentation with smooth whorls. *C. serrata* (HOERNES, 1873) from the Middle Miocene differs in spire height and sculpture.

Conclusion

The rich gastropod fauna described herein from a newly collected Lower Egerian mollusc assemblage has a great significance. Although it contains characteristic Egerian index taxa, the lack of several Egerian indices on the one hand, and the presence of previously unknown taxa from Hungary on the other demonstrate a unique faunal composition. Up until now such a mixture of Egerian gastropods has never been recognized from the Paratethys. The exact age of the fauna, the comprehensive faunal evaluation and the detailed palaeobiogeographical assessment require further research.

Acknowledgements

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Kézirat beérkezett: 2016. 02. 23.

Plate 1 — 1. tábla

Shell length (SL) in mm. Photos by Péter BALÁZS (P. B.) and Zoltán KOVÁCS (Z. K.).
Házmagasság (SL) mm-ben. A fotókat BALÁZS Péter (P. B.) és KOVÁCS Zoltán (Z. K.) készítette.

Fig. 1. *Glycymeris latiradiata* (SANDBERGER in GÜMBEL), (INV 2016.55.), Unit C, SL: 28 (×2) (Z. K.)
Fig. 2. *Glycymeris latiradiata* (SANDBERGER in GÜMBEL), (INV 2016.56.), Unit C, SL: 29 (×2) (Z. K.)
Figs 3–4. *Melanopsis hantkeni* HOFMANN, (INV 2016.57.), Unit C, SL: 27 (×1.6) (Z. K.)
Fig. 5. *Granulolabium plicatum* (BRUGUIÈRE), (INV 2016.58.), Unit C, SL: 21 (×2) (Z. K.)
Fig. 6. *Tympanotonos margaritaceus* (BROCCHI), (INV 2016.1.), Unit C, SL: 51 (×1.3) (Z. K.)
Fig. 7. *Diastoma elongata* BRONGNIART, (INV 2016.3.), Unit C, SL: 35 (×2) (P. B.)
Fig. 8. *Cerithium egerense* GÁBOR, (INV 2016.59.), *ex situ*, SL: 37 (×1.5), (Z. K.)
Fig. 9. ?*Plesiotrochus* sp., (INV 2016.2.), Unit C, SL: 9 (×4) (Z. K.)
Fig. 10. *Haustator venus* D'ORBIGNY, (INV 2016.60.), Unit C, SL: 39 (×2) (Z. K.)
Fig. 11. *Haustator turris* BASTEROT, (INV 2016.61.), Unit B1, SL: 25 (×2) (Z. K.)
Fig. 12. *Drepanocheilus speciosus* (SCHLOTHEIM), (INV 2016.4.), Unit C, SL: 27 (×2) (Z. K.)
Fig. 13. *Aporrhais callosa* TELEGDI-ROTH, (INV 2016.5.), Unit C, SL: 23.5 (×2) (Z. K.)
Fig. 14. *Globularia sanctistephani* (COSSMANN et PEYROT, 1919), (INV 2016.62.), Unit C, SL: 46 (×1.5) (Z. K.)
Fig. 15. *Globularia sanctistephani* (COSSMANN et PEYROT, 1919), (INV 2016.63.), Unit C, SL: 49 (×1.5) (Z. K.)
Fig. 16. *Ampullinopsis crassatina* (LAMARCK), (INV 2016.64.), Unit E, SL: 50 (×1.5) (Z. K.)

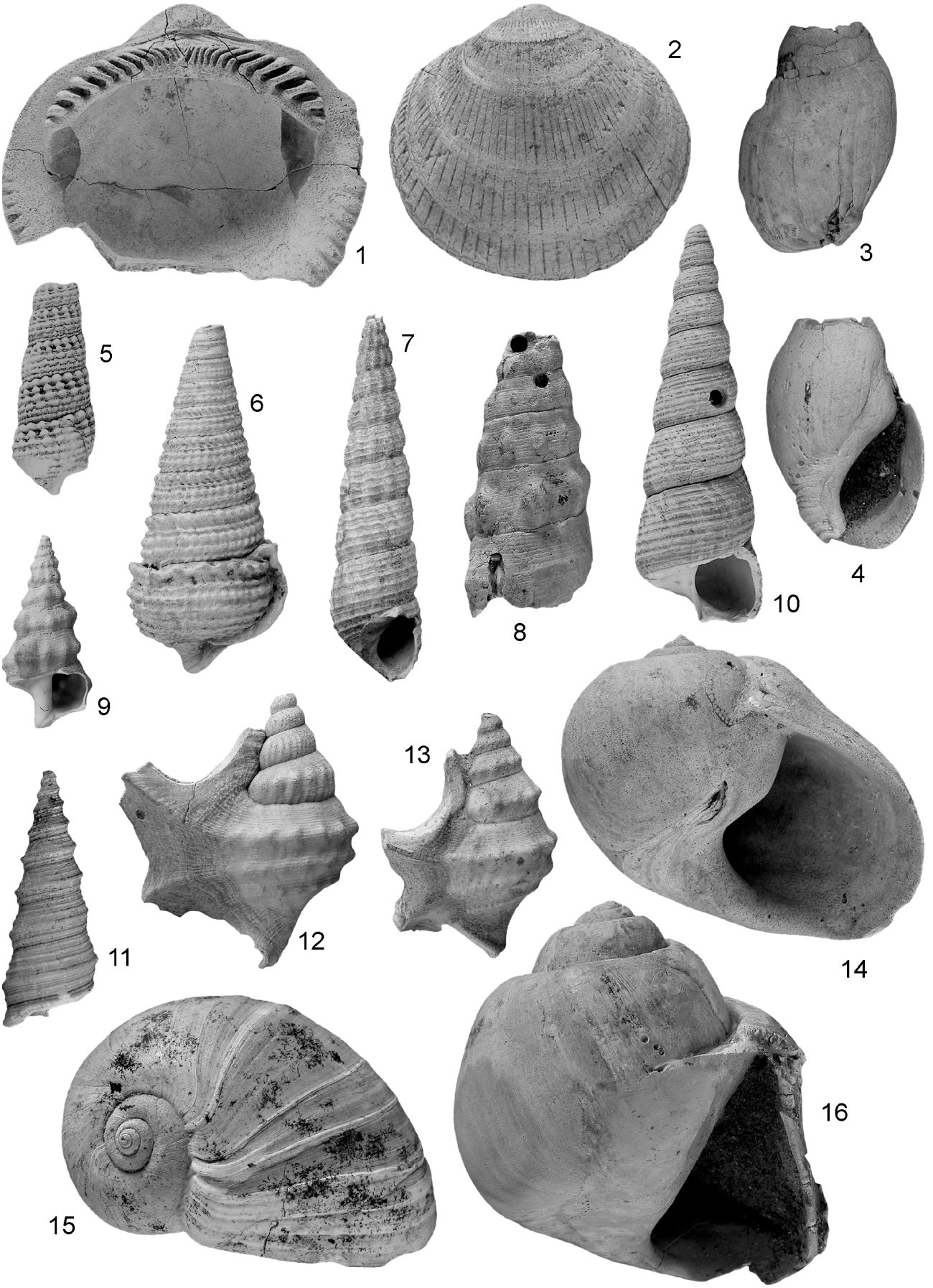
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Plate 2 — 2. tábla

Figs 1–3. *Cypraeorbis hungarica* SCHILDER, (Z. Vicián's priv. coll.), Unit C, SL: 29 (×2) (Z. K.)
Fig. 4. *Cassidaria depressa* BUCH, (INV 2016.65.), Unit C, SL: 33 (×1.5) (Z. K.)
Fig. 5. *Sassia turrita* (EICHWALD), (INV 2016.6.), Unit C, SL: 19 (×2.5) (P. B.)
Figs 6–7. *Crassimurex* (*Eopaziella*) *deshayesi* (NYST), (INV 2016.7.), Unit C, SL: 37 (×1.5) (P. B.)
Fig. 8. *Crassimurex* (*Eopaziella*) *capito* (PHILIPPI), (INV 2016.8.), Unit C, SL: 45 (×1.5) (P. B.)
Fig. 9. *Typhis pungens* (SOLANDER), (INV 2016.10.), Unit E, SL: 30 (×2) (Z. K.)
Fig. 10. *Lyrotyphis cuniculosus* (NYST), (INV 2016.9.), Unit C, SL: 22 (×2.5) (P. B.)
Fig. 11–12. *Chicoreus* (*Triplex*) *trigonalis* (GÁBOR), *ex situ* (T. Németh's priv. coll.), SL: 39 (×2) (Z. K.)
Fig. 13. *Chicoreus* (*Triplex*) *trigonalis* (GÁBOR), (INV 2016.11.), *ex situ*, SL: 30.5 (×2) (P. B.)
Figs 14–15. *Paziella* sp., (INV 2016.12.), Unit C, SL: 25 (×2) (P. B.)
Fig. 16. *Volutilithes* cf. *apenninica* (MICHELOTTI), (INV 2016.36.), Unit E, SL: 26 (×3) (Z. K.)
Fig. 17. *Paziella* sp., (INV 2016.13.), Unit C, SL: 21 (×2.5) (P. B.)
Fig. 18. *Melongena basilica* (BELLARDI), (INV 2016.66.), Unit E, SL: 52 (×1.5) (Z. K.)

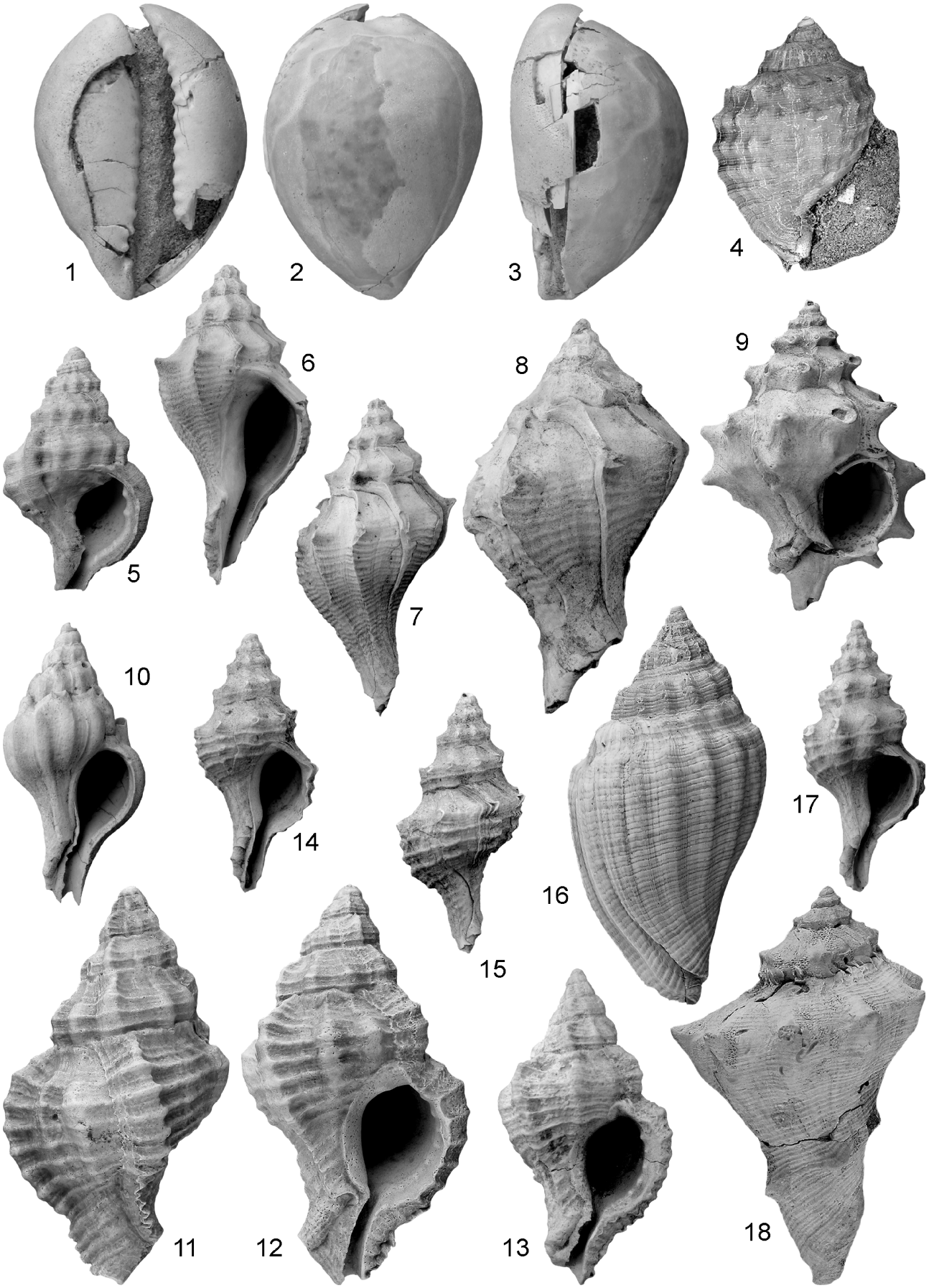
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Plate 3 — 3. tábla

Fig. 1. *Pugilina katalinae* nov. sp., paratype (PAL 2016.12.), Unit B1, SL: 56 (×1.5) (P. B.)
Figs 2–3. *Pugilina katalinae* nov. sp., holotype (PAL 2016.10.), Unit B1, SL: 45 (×1.5) (P. B.)
Figs 4–5. *Pugilina katalinae* nov. sp., paratype (PAL 2016.11.), Unit E, SL: 53 (×1.5) (P. B.)
Fig. 6. *Babylonia eburnoides* (MATHÉRON), (INV 2016.18.), Unit E, SL: 23.5 (×2) (Z. K.)
Fig. 7. *Babylonia eburnoides* (MATHÉRON), (INV 2016.17.), Unit E, SL: 35 (×1.8) (Z. K.)
Fig. 8. *Euthriofusus szontaghi* NOSZKY, (INV 2016.19.), Unit C, SL: 23 (×2) (P. B.)
Figs 9–10. *Scalaspira elegantula* (PHILIPPI), (INV 2016.20.), Unit C, SL: 29 (×2) (P. B.)
Figs 11–12. *Parvisipho scrobiculatus* (BOLL), (INV 2016.21.), Unit C, SL: 23 (×2.5) (P. B.)
Fig. 13. *Parvisipho scrobiculatus* (BOLL), (INV 2016.22.), Unit C, SL: 18 (×3) (P. B.)
Figs 14–15. *Pseudolatirus mayeri* (BELLARDI), (INV 2016.23.), Unit C, SL: 34 (×2) (P. B.)
Fig. 16. *Pseudolatirus mayeri* (BELLARDI), (INV 2016.24.), Unit C, SL: 26 (×2.5) (P. B.)
Fig. 17. *Streptodictyon* cf. *soellingensis* (TEMBROCK), (INV 2016.26.), Unit C, SL: 17 (×3) (P. B.)
Fig. 18. *Streptodictyon* cf. *soellingensis* (TEMBROCK), (INV 2016.25.), Unit C, SL: 25.5 (×2.5) (P. B.)
Fig. 19. *Streptodictyon* cf. *subelongatus* (D'ORBIGNY), (INV 2016.27.), Unit C, SL: 10 (×4) (Z. K.)
Fig. 20. *Cominella flurli* (GÜMBEL), (INV 2016.28.), Unit C, SL: 23 (×2.5) (P. B.)
Fig. 21. *Nassarius* cf. *intercisus* (MICHELOTTI), (INV 2016.30.), Unit C, SL: 16 (×3) (P. B.)
Figs 22–23. *Nassarius* cf. *intercisus* (MICHELOTTI), (INV 2016.29.), Unit C, SL: 18 (×3) (P. B.)

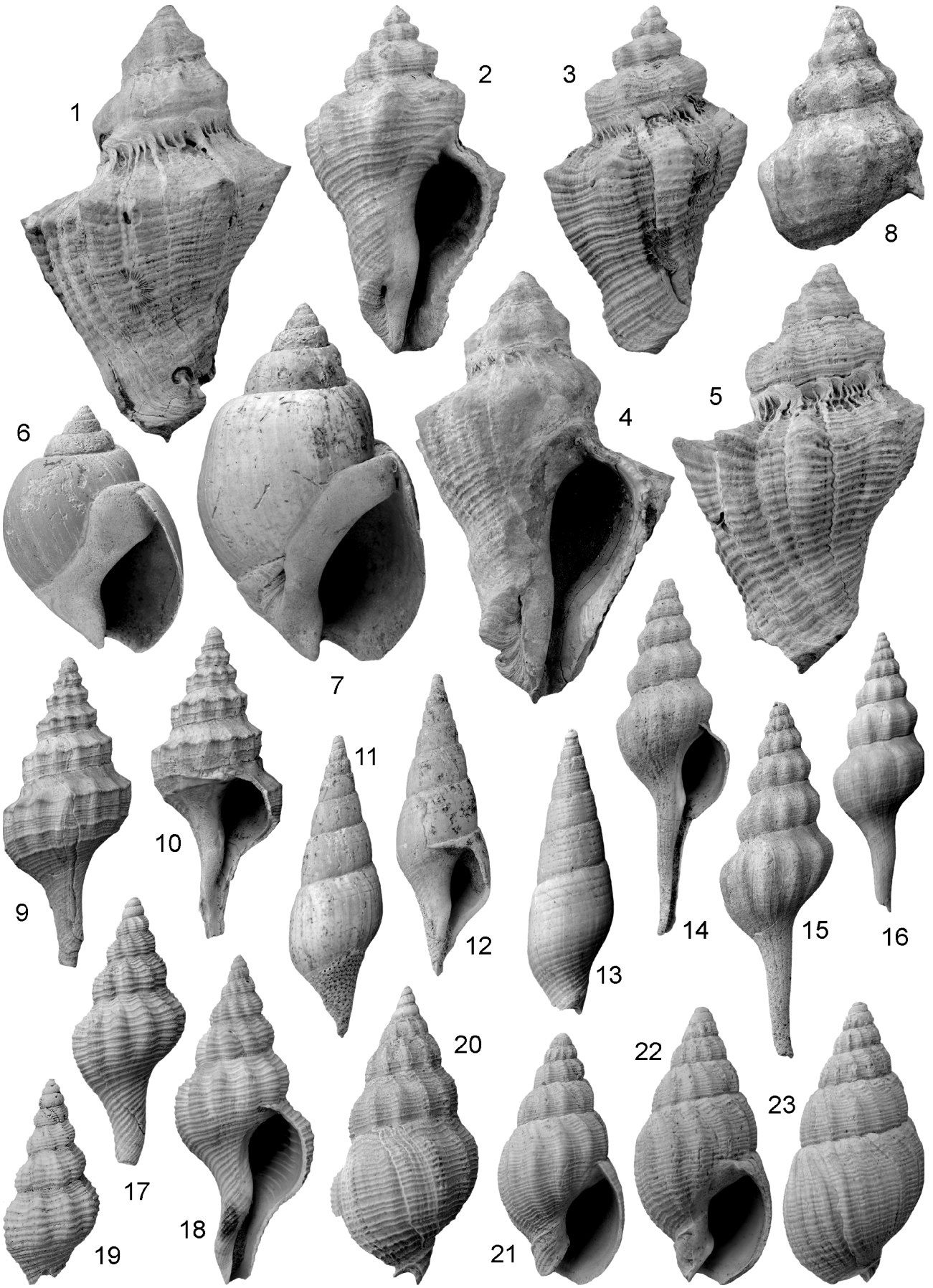
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Plate 4 — 4. tábla

Figs 1–2. *Nassarius hevesensis* (BÁLDI), (INV 2016.31.), Unit C, SL: 9 (×4) (Z. K.)
Figs 3–4. *Nassarius* sp. B, (INV 2016.32.), Unit B1, SL: 9 (×4) (Z. K.)
Figs 5–6. *Nassarius* sp. C, (INV 2016.33.), Unit B1, SL: 10.5 (×4) (Z. K.)
Figs 7–8. *Nassarius fortecostatus* (HÖLZL), (INV 2016.34.), Unit C, SL: 7.5 (×5) (Z. K.)
Figs 9–10. *Nassarius* sp. A, (INV 2016.35.), Unit C, SL: 9 (×4) (Z. K.)
Figs 11–13. *Dorsanum strigoniense* nov. sp., holotype (PAL 2016.1.), Unit C, SL: 16 (Figs 11, 13 = ×5, Fig. 12 = ×10) (P. B.)
Figs 14–15. *Dorsanum strigoniense* nov. sp., paratype (PAL 2016.2.), Unit C, SL: 16.5 (Fig. 14 = ×5, Fig. 15 = ×8) (P. B.)
Fig. 16. *Dorsanum strigoniense* nov. sp., paratype (PAL 2016.3.), Unit C, SL: 14 (×5) (P. B.)
Figs 17–18. *Marginella vadaszi* BÁLDI, (INV 2016.37.), Unit C, SL: 11 (×4.5) (Z. K.)
Figs 19–20. *Marginella vadaszi* BÁLDI, (INV 2016.38.), Unit C, SL: 12.5 (×4) (Z. K.)
Figs 21–22. *Spirancilla indivisa* (KOCH et WIECHMANN), (INV 2016.39.), Unit C, SL: 18.5 (×3.5) (P. B.)
Fig. 23. *Eoconus* ex gr. *diversiformis* (DESHAYES), (INV 2016.40.), Unit C, SL: 17 (×3) (P. B.)
Fig. 24. *Eoconus* ex gr. *diversiformis* (DESHAYES), (INV 2016.45.), Unit C, SL: 21 (×3) (P. B.)
Figs 25–26. *Sveltia nemethi* nov. sp., holotype (PAL 2016.15.), *ex situ*, SL: 22 (×3) (Z. K.)

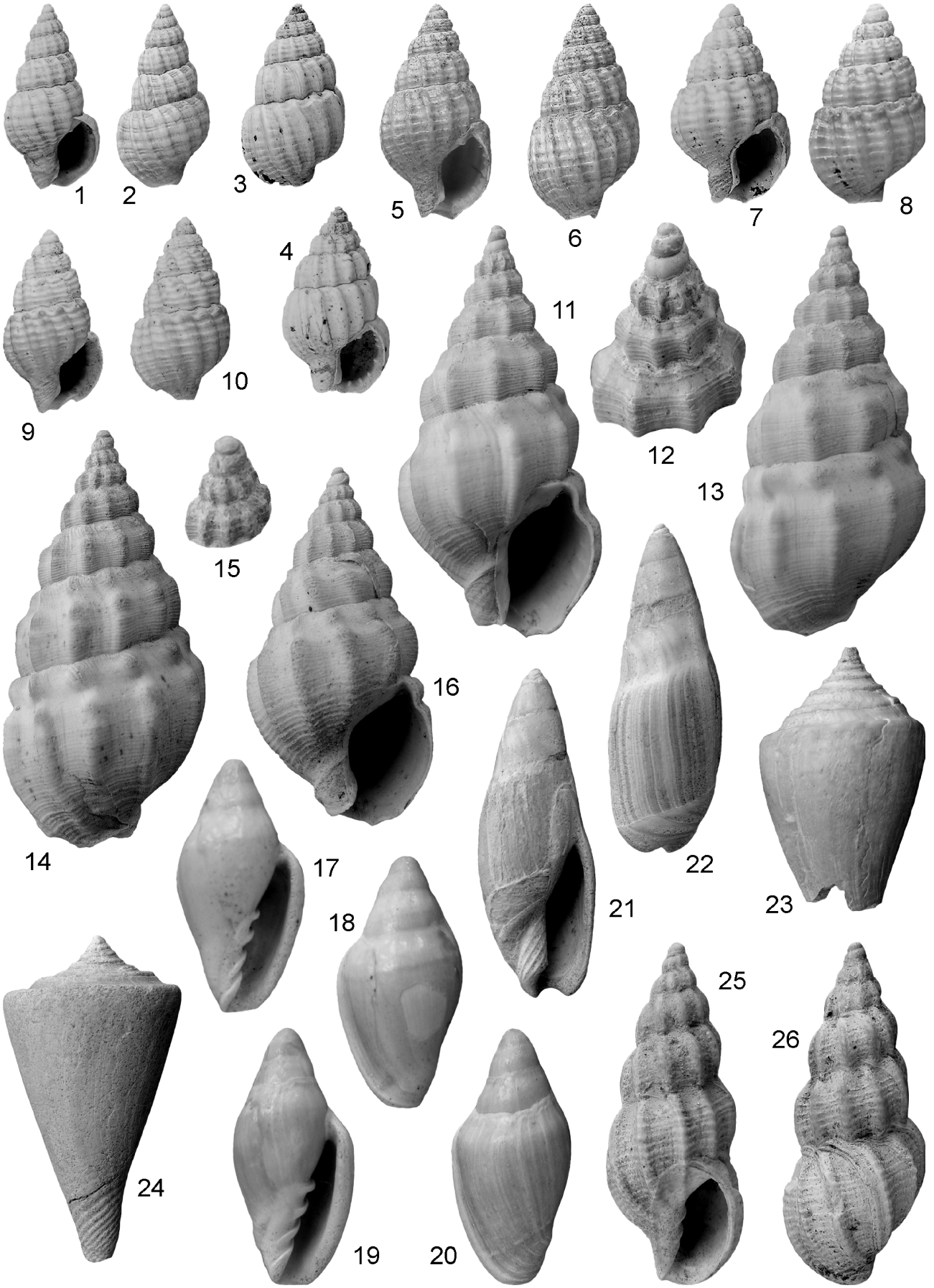
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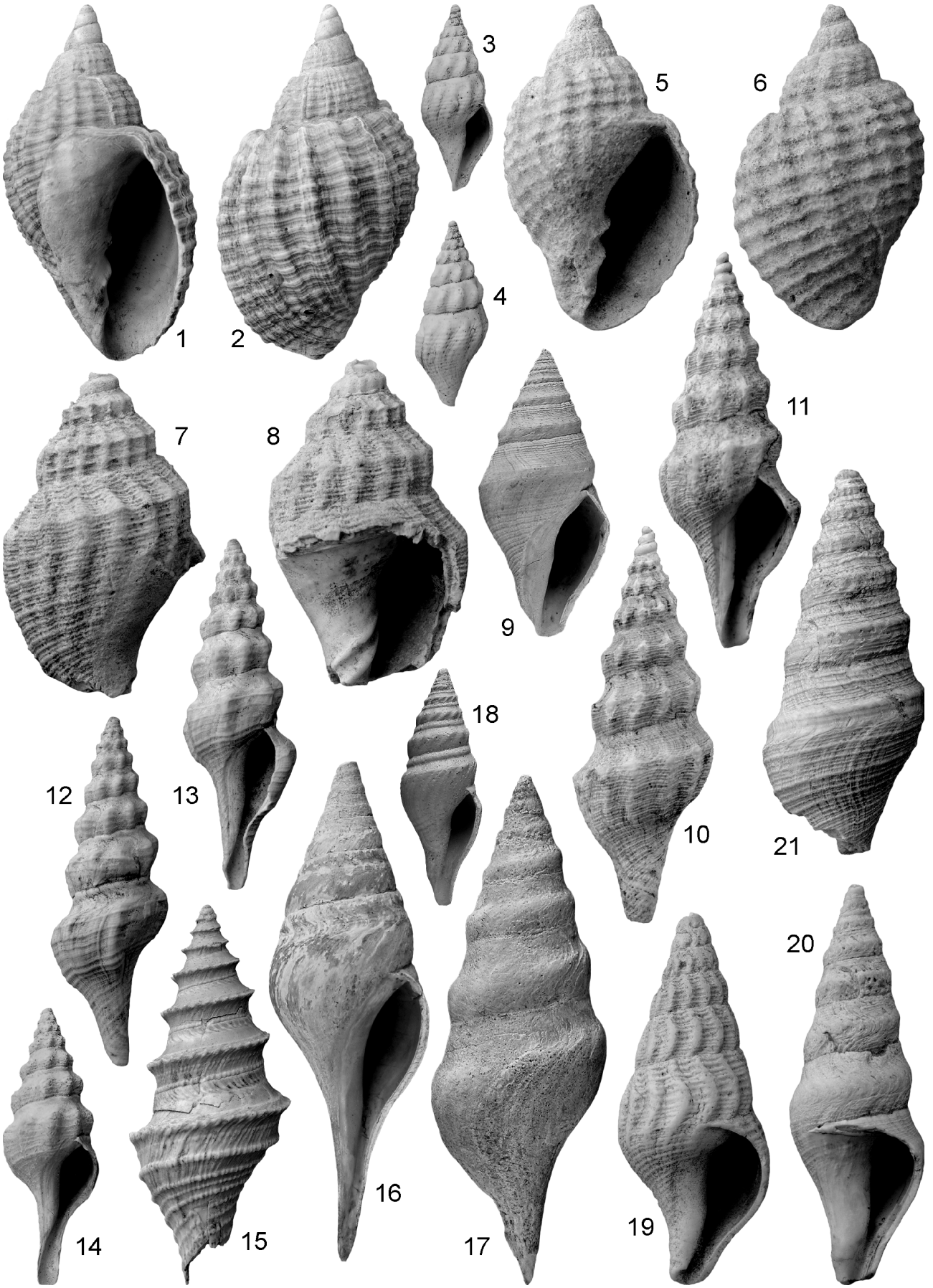
Plate 5 — 5. tábla

Figs 1–2. *Merica krocki* nov. sp., holotype (PAL 2016.13), Unit B1, SL: 23 (×3) (P. B.)
Figs 3–4. *Cordieria* sp., (INV 2016.44.), Unit C, SL: 12 (×3) (Z. K.)
Figs 5–6. *Merica krocki* nov. sp., paratype (PAL 2016.14.), Unit C, SL: 18 (×3.5) (P. B.)
Figs 7–8. *Turehua plexa* (WOLFF), (INV 2016.43.), Unit C, SL: 18 (×3.5) (P. B.)
Fig. 9. *Bathytoma cataphracta* (BROCCHI), (INV 2016.67.), Unit C, SL: 28 (×2) (Z. K.)
Figs 10–11. *Raphitoma valdecarinata* BÁLDI, (INV 2016.46.), Unit C, SL: 13 (×6) (P. B.)
Figs 12–13. *Pleurofusia pseudosubtilis* (PEYROT), (INV 2016.47.), Unit C, SL: 27 (×2.5) (P. B.)
Fig. 14. *Pleurofusia pseudosubtilis* (PEYROT), (INV 2016.48.), Unit C, SL: 17.5 (×3) (Z. K.)
Fig. 15. *Cochlespira* sp., (INV 2016.50.), Unit C, SL: 29 (×2.5) (P. B.)
Fig. 16. *Orthosurcula* ex gr. *regularis* (KONINCK), (INV 2016.51.), Unit C, SL: 49 (×1.8) (Z. K.)
Fig. 17. *Orthosurcula* ex gr. *regularis* (KONINCK), (INV 2016.52.), Unit C, SL: 50 (×1.8) (Z. K.)
Fig. 18. *Domenginella ilonae* (BÁLDI, 1966), (INV 2016.14.), Unit C, SL: 11.5 (×4) (Z. K.)
Fig. 19. *Fusiturris duchasteli* (NYST), (INV 2016.49.), Unit C, SL: 18 (×4) (P. B.)
Fig. 20. *Polystira konincki* (NYST), (INV 2016.54.), Unit C, SL: 31 (×2.5) (P. B.)
Fig. 21. *Gemmula laticlavia* (BEYRICH), (INV 2016.53.), Unit C, SL: 25 (×3) (P. B.)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