

Toarcian Dactyloceratidae (Ammonitina) from the Gerecse Mts (Hungary)

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(with 2 figures and 7 plates)

Taxonomic and stratigraphic problems of the family Dactyloceratidae and genera *Dactyloceras*, *Microdactylites*, *Zugodactylites*, *Peronoceras*, *Porpoceras*, *Catacoeloceras*, *Mucrodactylites*, *Septimaniceras*, *Nodicoeloceras*, *Mesodactylites*, *Transicoeloceras*, *Telodactylites* and *Collina* included in it are briefly discussed. 31 species of Dactyloceratidae are described and illustrated from the Lower–Middle Toarcian ammonite assemblages of the Gerecse Mts (NE Transdanubian Range, Hungary). Four new species are introduced: *Microdactylites tardosensis* n. sp., *Nodicoeloceras dulaii* n. sp., *Mesodactylites pisznicensis* n. sp., *Telodactylites levisettii* n. sp. The fauna described here is closely allied to the Mediterranean Province of the Mediterranean-Caucasian Realm.

Introduction

This paper offers a detailed taxonomic treatment of species belonging to genera of the family Dactyloceratidae from the ammonite assemblages of the Gerecse Mts, as a contribution of the comprehensive treatment of the Toarcian ammonite material deposited in the Eötvös Museum of Natural History, Budapest. The material was collected from different localities of the Gerecse Mts (Figure 1) by the staff of the Geological Institute of Hungary between 1976 and 1982. The first taxonomic, quantitative and paleobiogeographic analyses were provided by GÉCZY (1984, 1985), the Middle Toarcian Ammonitina fauna and biostratigraphy were presented in detail by GÉCZY & SZENTE (2007), KOVÁCS (2010, 2013, 2014), whereas the taxonomy and biostratigraphy of Lower Toarcian assemblages were dealt with by KOVÁCS (2012). Ammonite materials of two other Toarcian sections from the Gerecse Mts (Kis-Teke Hill, Nagy-Pisznice Hill – Crocodile) were described by GÉCZY et al. (2008), and GALÁCS et al. (2011), respectively. The constant dominance of suborders Phylloceratina and Lytoceratina, as well as the occurrences of several characteristic Ammonitina

genera assigned these Toarcian assemblages to the Mediterranean Province, with close affinities to those known from Italy and Greece. Nevertheless, sporadic appearances of zonal indices enabled the application of the detailed NW European zonal stratigraphy for these basically Mediterranean ammonite faunal successions. The biostratigraphic subdivision of the Middle Toarcian in the Gerecse sections is shown on Figure 2.

The Lower–Middle Toarcian successions in the area are characterized by an "Ammonitico Rosso marl" subfacies, the Kisgercse Marl Formation. It is a thin-bedded, red nodular marl of variable carbonate and clay content, that is rich in ammonites; however, the remains are mainly poorly to moderately preserved internal molds (KNAUER 2012).

Note: The following abbreviations are used in this paper for measurements (M): D – diameter, H – whorl-height, W – whorl-width, Uw – umbilical-width, PRLW – primary ribs of the last whorl. The description of suture-construction is based on VENTURI & FERRI (2001). Abbreviations: E – external lobe, L – lateral lobe, U – umbilical lobe, ES – external saddle, LS – lateral saddle.

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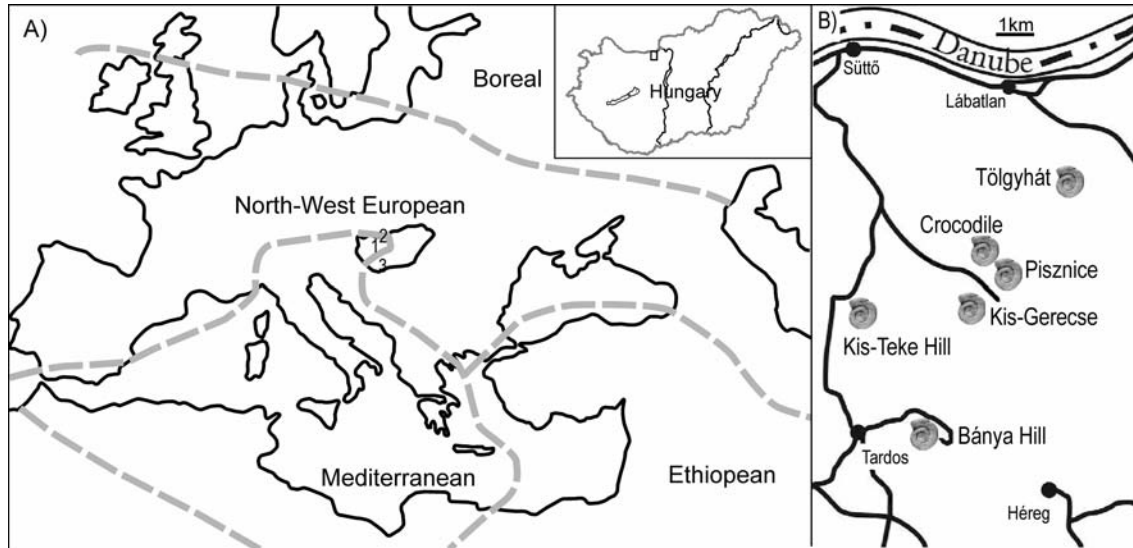


Figure 1. A) Middle Toarcian ammonite faunal provinces in Europe and W Asia: (PAGE 2008), 1 – Bakony Mts, 2 – Gerecse Mts, 3 – Mecsek Mts; B) Location of Toarcian sections examined in the Gerecse Mts.

Systematic paleontology

Classis Cephalopoda CUVIER, 1797
 Subclassis Ammonoidea ZITTEL, 1884
 Ordo Ammonitida FISCHER, 1882
 Subordo Ammonitina FISCHER, 1882
 Superfamilia Eoderoceratoidea SPATH, 1929

Family Dactylioceratidae HYATT, 1867

A comprehensive taxonomic, paleobiogeographic and phylogenetic treatment of the family was recently presented by RULLEAU et al. (2013) containing almost all publications issued on the Toarcian Dactylioceratidae. For the research of the family in the European faunal provinces during the Middle Toarcian, the following studies are of primary importance from the last 50 years: GÉCZY (1967a, 1990), DAGIS (1968), GUÉX (1970, 1971, 1972, 1973), PINNA & LEVI-SETTI (1971), SCHMIDT-EFFING (1972, 1975), HOWARTH (1978, 2013), JIMÉNEZ & RIVAS (1991), MOUTERDE & ELMÍ (1991), ELMÍ et al. (1997), KUTYGIN & KNYAZEV (2000), VENTURI & FERRI (2001), FAURÉ (2002), METODIEV (2003), MORARD (2004), RULLEAU (2007), and VENTURI et al. (2010).

Based on marked differences concerning the morphology and paleobiogeographic range of genera, the family has been traditionally divided into *Dactylioceras*-group and *Nodicoeloceras*-group, however, without any consensus on subfamily- or genus-level classification. In this paper, both the two subfamilies proposed by VENTURI & FERRI (2001) for Toarcian

dactylioceratids, and the genus-level considerations by RULLEAU et al. (2013) are accepted with some amendments. Accordingly, the following taxonomic scheme is used here to describe the examined ammonite assemblages:

Family Dactylioceratidae HYATT
 Subfamily Dactylioceratinae HYATT
 Genera *Dactylioceras* HYATT
Microdactylites BUCKMAN
Zugodactylites BUCKMAN
Peronoceras HYATT
Porpoceras BUCKMAN
Catacoeloceras BUCKMAN
Mucrodactylites BUCKMAN
Septimaniceras FAURÉ
 Subfamily Nodicoeloceratinae VENTURI et FERRI
 Genera *Nodicoeloceras* BUCKMAN
Mesodactylites PINNA et LEVI-SETTI
Transicoeloceras PINNA
Telodactylites PINNA et LEVI-SETTI
Collina BONARELLI

The stratigraphic range of Dactylioceratidae

species known from the Gerecse sections is shown on Figure 2.

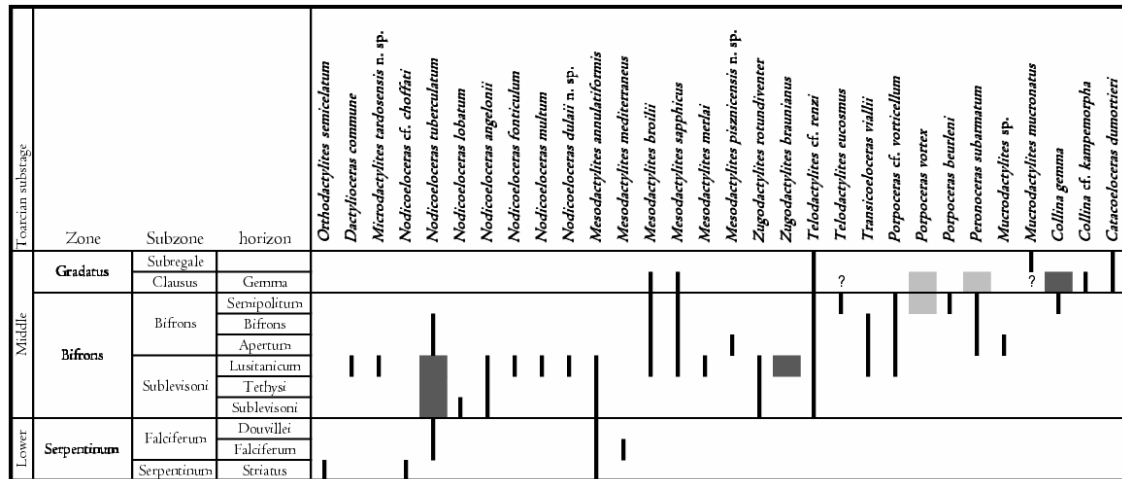


Figure 2. Chronostratigraphic distribution of dactyloceratid species in the Gerecse Mts (thin line: rare, light gray square: frequent, dark gray square: abundant)

Subfamily Dactyloceratinae HYATT, 1867

Genera placed within the taxon are connected by close phylogenetic lineage in the family, as well as are typical of the NW European faunal province.

Genus *Dactyloceras* HYATT, 1867

Type-species: *Ammonites communis* SOWERBY, 1815.

Remarks: The following subgenera are accepted in the literature: *D. (Dactyloceras)* HYATT, 1867, *D. (Eodactylites)* SCHMIDT-EFFING, 1972, *D. (Orthodactylites)* BUCKMAN, 1926, *D. (Iranodactylites)* REPIN, 2000. The second one that is thought to be the zonal index of the Toarcian Stage (ELMI 2007, COMAS-RENGIFO et al. 2010) probably derived from genus *Reynesoceras* SPATH in the uppermost Pliensbachien, and it was the ancestor of *Orthodactylites*.

From Toarcian localities of Hungary, *D. (Orthodactylites)* and *D. (Dactyloceras)* can be documented.

Subgenus *Dactyloceras (Orthodactylites)* BUCKMAN, 1926

Type-species: *Orthodactylites directum* BUCKMAN, 1926.

Diagnosis: Evolute coiling, slightly convex flanks, broad venter, subcircular section, dense to distant, annular, simple, bi- or trifurcating ribbing. Suture-line: wide, long E, shorter, trifid L, short, straight U lobes; wide ES, higher, narrower LS1.

Distribution: Tenuicostatum – lower Serpentinum Zones: Europe, North Africa, Iran,

Tibet, NE Russia, North and South America. Hungary: Mecsek Mts (*D. cf. anguinum* REINECKE, see VADÁSZ 1935), Gerecse Mts.

Dactyloceras (Orthodactylites) semicelatum (SIMPSON, 1843) (Plate 1, figs 1, 7)

1843 *Ammonites semicelatus* — SIMPSON, p. 20

1980 *Dactyloceras (Orthodactylites) semicelatum* (SIMPSON) — HOWARTH, p. 646, text-figs 2–3, pls 80–81, pl. 82, figs 11–12 (cum syn.)

2012 *Dactyloceras (Orthodactylites) aff. directum* (BUCKMAN) — KOVÁCS, p. 15, pl. 4, fig. 5

2013 *Dactyloceras (Orthodactylites) semicelatum* (SIMPSON) — RULLEAU et al., p. 72, pl. 4, figs 2–7 (cum syn.)

Material: Three fragmentary specimens (220.2011, 2014.55.1–2).

Measurement s	D	H	H/D	W	W/H	Uw	Uw/D
220.2011	75	20	26.6%	18	90%	?	?
2014.55.1	75	20	26.6%	20	100%	38	50.6%
2014.55.2	72	20	27.7%	?	?	?	?

Description: Moderately evolute coiling, suboval whorl-section, slightly convex to flat flanks, rounded venter. The preserved part of the body chamber is one whorl in length. Dense, narrow, sharp, rectiradiate ribs crossing the venter. Almost all second ribs bifurcate at about mid-height without tubercles.

Remarks: The species *D. (Orthodactylites) directum* (BUCKMAN) recorded by KOVÁCS (2012) from the Gerecse Mts is regarded as a synonym of *D. (Orthodactylites) semicelatum*.

Distribution: Gerecse Mts: Serpentinum

Subzone: Kis-Gerecse and Bányá Hill B Sections.

Subgenus *Dactylioceras* (*Dactylioceras*) HYATT, 1867

Diagnosis: Evolute, compressed coiling, convex flanks, subrectangular to subcircular whorl-section, regular, furcating, dense to distant ribbing. Suture-line: wide, long E, shorter, trifid L, short, straight U lobes; wide ES, narrower LS1.

Remark: The genus probably was the descendant of *Orthodactylites*.

Distribution: Serpentinum – Bifrons Zones: Europe, North Africa, the Caucasus, Iran, Pakistan, Spitzbergen, Greenland, NE Russia, SE Asia, North and South America. Hungary: Mecsek Mts, Bakony Mts (Úrkút) [*D. commune* (SOWERBY), *D. toxophorum* BUCKMAN]), Gerecse Mts.

Dactylioceras (*Dactylioceras*) *commune*
(SOWERBY, 1815)
(Plate 1, fig. 2)

1815 *Ammonites communis* — SOWERBY, p. 10, pl. 107, figs 2–3

1966 *Dactylioceras* sp. aff. *curvicosta* (BUCKMAN) — GÉCZY, p. 430, pl. 2, fig. 2

2013 *Dactylioceras* (*Dactylioceras*) *commune* (SOWERBY) — RULLEAU et al., p. 78, pl. 7, figs 2–4, pl. 8, figs 1–2, pl. 9, figs 1–2, 5–6, pl. 13, figs 1–2

Material: One wholly septate and one fragmentary specimens (2014.25.1–2).

Measurements	D	H	H/D	W	W/H	Uw
2014.25.1	52	13	25%	13	100%	?

Description: Evolute coiling, wide and shallow umbilicus, convex flanks, rounded venter, wide suboval section. Strong, distant, rectiradiate primary ribs bifurcate regularly at the shoulder without any tubercles. The paired secondaries bend slightly forward.

Remark: The species is typical of the NW European Province; however, it was recorded from Mediterranean localities (Austria, Italy, Greece, Southern Spain, Portugal) as well.

Distribution: Europe, the Caucasus, Iran, NE Russia, North and South America. Hungary: Bakony Mts (Úrkút). Gerecse Mts: Sublevisoni Subzone: Bányá Hill A and Pisznice Sections.

Genus *Microdactylites* BUCKMAN, 1926

Type-species: *Ammonites attenuatus* SIMPSON, 1855.

Diagnosis: Small size, evolute, compressed

coiling, slightly convex to convex flanks, suboval to subcircular whorl-section, dense, single or bifurcating ribs. Simple suture-line: wide and short E and L, short U lobes, wide and low saddles.

Remarks: The validity of the taxon is debated in the literature (MORARD 2004, HOWARTH 2013, RULLEAU et al. 2013). The species placed within *Microdactylites* represent microconch forms of genus *Dactylioceras*.

Distribution: Serpentinum – lower Bifrons Zones: England, France, Germany, Italy.

Microdactylites tardosensis n. sp.
(Plate 1, fig. 3)

Holotype: 2014.26.1 (Eötvös Museum of Natural History)

Derivation of name: The name refers to the type locality.

Type locality and horizon: Sublevisoni Subzone, Bányá Hill A Section, Tardos, Gerecse Mts.

Material: 1 well-preserved internal mold of an adult specimen.

M	D	H	H/D	W	W/H	U w	Uw/D	PRL W
2014.26.1	27	6	22.2%	5	83.3%	15	55.5%	52

Diagnosis: Small size, evolute, compressed coiling, suboval whorl-section, sharp, rectiradiate, simple and bifurcating ribs, simple peristome.

Description: Evolute coiling, wide and shallow umbilicus, slightly convex flanks, rounded shoulder, arched venter, suboval whorl-section. The body chamber is about ¾ whorl in length. The peristome is simple and oblique, preceded by a wide and shallow contract. Sharp and rectiradiate ribs. One or two simple primaries alternate with ribs bifurcating at the ventrolateral shoulder, the secondaries pass the venter. The suture-line agrees with that of the genus.

Remarks: Based on size, suture-line and morphology, the new species is placed within genus *Microdactylites*. *M. tardosensis* n. sp. differs from *M. attenuatus* (SIMPSON) and *M. arcus* (BUCKMAN) in rectiradiate and more widely spaced ribs, from ?*M. gracilis* (SIMPSON) in compressed and more evolute coiling, and from ?*M. microdactyliformis* (MAUBEUGE) in more evolute shell.

Distribution: The specimen came from the condensed Bed 45 of the Bányá Hill A Section associated with *Hildoceras sublevisoni* FUCINI, *H. lusitanicum* MEISTER, *Harpoceras subexaratum* BONARELLI, *Dactylioceras commune*, and *Nodicoeloceras tuberculatum* (KOTTEK).

Genus *Zugodactylites* BUCKMAN, 1926

Type-species: *Ammonites braunianus* D'ORBIGNY, 1845.

Diagnosis: Small to medium-sized, evolute, compressed to somewhat depressed coiling; narrow, subcircular to suboval whorl-section; rounded venter. Keel appears on one species [*Z. pseudobraunianus* (MONESTIER)]. Ribs fine, straight to slightly curved, moderately dense to dense. Primaries regularly bifurcate at small ventrolateral tubercles; secondaries are bent forward on the venter. Intricate suture-line: long and wide E, shorter, ramified L, straight, short U lobes, wide ES, low and asymmetrically divided LS1.

Remarks: *Zugodactylites* was treated in detail by e.g. FISCHER (1966), PINNA & LEVI-SETTI (1971), HOWARTH (1978), and RULLEAU et al. (2013). The genus probably derived from (*D.*) *Dactylioceras* in the lower Sublevisoni Subzone. It is characterized by sexual dimorphism, the microconch genus *Gabillytes* GUEX was described from France and England. Based on morphology and stratigraphic range, *Planicoeloceras* VENTURI et FERRI, 2001 is considered here as a synonym of *Zugodactylites*.

Distribution: Bifrons Zone: NW European Province (France, Northern Spain, England, Bulgaria, Romania, Russia), Mediterranean Province (Austria, Italy, Southern Spain, Portugal, ?Algeria). It was also recorded from the Spitsbergen, Iran, New Zealand, and North America. Hungary: Bakony Mts (Úrkút), Gerecse Mts. In the Gerecse sections, the acme of the genus coincides with that of *Frechiella* in the Lusitanicum horizon (KOVÁCS 2010).

Zugodactylites braunianus (D'ORBIGNY, 1845)
(Plate 1, figs 4–5, 9)

- 1845 *Ammonites braunianus* — D'ORBIGNY, p. 327, pl.104, figs 1–3
 v 1966 *Zugodactylites sapunovi* n. sp. — GÉCZY, p. 440, pl. 1, fig. 3
 v 2007 *Zugodactylites pseudobraunianum* (MONESTIER) — GÉCZY & SZENTE, pl. 1, figs 1–2
 2008 *Zugodactylites braunianus* (D'ORBIGNY) — GÉCZY et al., pl. 1, fig. 9

Material: 35 specimens in different state of preservation (2014.38.1–34, and one specimen from the private collection of Mihály DUNAI).

M	D	H	H/D	W	W/H	Uw	Uw/D
MDPC2013.1	90	18	20%	716	88.8%	57	63.3%
2014.38.1	61	14	23%	14	100%	33	54%
2014.38.2	53	11	20.7%	9	81.8%	32	60.3%

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.38.3	48	10	20.8%	8	80%	30	62.5%
2014.38.4	43	10	23.2%	6	60%	25	58.1%
2014.38.5	40	11	27.5%	10	91%	20	50%

Description: Evolute, compressed coiling; shallow umbilicus, narrow, suboval whorl-section; high, rounded venter. Fine, straight to slightly curved, dense primaries bifurcate regularly at small ventrolateral tubercles, the secondaries are forwardly projected. The shell moderately varies in whorl width.

Remark: The specimen figured by GÉCZY & SZENTE (2007, pl. 1, figs 1–2, 2014.38.9) lacks the ventral keel, and is characterized by a narrow whorl that is not typical of *Z. pseudobraunianus*.

Distribution: Gerecse sections: Sublevisoni Subzone.

Zugodactylites rotundiventer BUCKMAN, 1927
(Plate 1, fig. 6)

- 1927 *Zugodactylites rotundiventer* — BUCKMAN, pl. 743
 1978 *Zugodactylites rotundiventer* BUCKMAN — HOWARTH, p. 272, pl. 7, figs 5–6 (*cum syn.*)

Material: Eight poorly preserved specimens (2014.39.1–8).

Measurement s	D	H	H/D	W	W/H	Uw	Uw/D
2014.39.1	4	1	24.4	1	127.2	24	53.3
	5	1	%	4	%		
2014.39.2	4	1	24.4	1	130%	18	44%
	1	0	%	3			

Description: Evolute coiling; wide, rounded venter, depressed suboval whorl-section. Ribbing similar to that of *Z. braunianus*.

Remark: *Z. rotundiventer* differs from *Z. braunianus* in wide whorls and low venter.

Distribution: Gerecse sections: Sublevisoni Subzone.

Genus *Peronoceras* HYATT, 1867

Type-species: *Ammonites fibulatus* J. DE C. SOWERBY, 1823.

Diagnosis: Evolute, compressed to depressed cadicone coiling, slightly convex flanks, low venter, subrectangular whorl-section. Ribs strong, prorsiradiate, fibulate on inner whorls, tuberculate to spined on ventrolateral shoulder. Suture-line: long, wide E, shorter, wide L, wide, ramified saddles.

Remarks: *Peronoceras* was treated in detail by e.g. HOWARTH (1978), and RULLEAU et al. (2013). The genus appeared in the upper Sublevisoni Subzone, it is the descendant of either (*D.*) *Dactylioceras* or *Zugodactylites*. It differs from

Porpoceras BUCKMAN in regularly fibulate inner ribbing. The Mediterranean *Fibulocoeloceras* VENTURI et FERRI differs in sculpture with alternating simple and fibulate ribs.

Distribution: Bifrons to lowermost Variabilis/Gradatus Zones: Europe, North Africa, the Caucasus, the Pamir, Iran, Vietnam, Japan, North and South America. Hungary: Mecsek Mts, Bakony Mts (Szentgál, Úrkút), Gerecse Mts.

Peronoceras subarmatum (YOUNG et BIRD, 1822)
(Plate 1, fig. 8, Plate 2, fig. 1, Plate 3, fig. 6)

- 1822 *Ammonites subarmatus* — YOUNG & BIRD, p. 250, pl. 13, fig. 3
 v 2007 *Peronoceras subarmatum* (YOUNG et BIRD) — GÉCZY & SZENTE, pl. 8, fig. 1
 v 2008 *Peronoceras subarmatum* (YOUNG et BIRD) — GÉCZY et al., pl. 1, fig. 12

Material: Ten specimens in different state of preservation (2014.44.1–10).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.44.1	95	18	18.9%	30	166.6%	56	59%
2014.44.4	87	20	23%	22.5	112.5%	50	57.4%
2014.44.2	77	17	22%	25	147%	45	58.4%
2014.44.3	57	14	24.5%	?20	142.8%	30	52.6%

Description: Evolute coiling, oblique flanks, broad, low, rounded venter, depressed, subrectangular section. The preserved body chamber more than one whorl in length. Primary ribs well-developed, regularly fibulate on inner whorls, trifurcate at ventrolateral spines. On the body chamber, trifurcating, spined ribs alternate with simple, or bifurcating, non-tuberculate ribs. Secondaries cross the venter in a zigzag pattern between spines that are not opposite each other.

Remarks: According to RULLEAU et al. (2013), some records of *P. subarmatum* from the Mediterranean Province (Italy, Greece, Austria) might represent *Telodactylites* species. The Gerecse specimens are close to the type (refigured by RULLEAU et al. 2013, pl. 34, fig. 4) in morphology.

Distribution: Gerecse sections: Bifrons Subzone to the lowermost Clausus Subzone.

Genus *Porpoceras* BUCKMAN, 1911

Type-species: *Ammonites vortex* SIMPSON, 1855.

Diagnosis: Evolute coiling, subrectangular whorl-section. Fibulate, tuberculate to spined, bifurcating primary ribs alternate with nontuberculate, bifurcating ribs. The suture-line is similar to that of *Peronoceras*.

Remarks: The genus was dealt with by e.g. HOWARTH (1978), JIMÉNEZ & RIVAS (1991), and

RULLEAU et al. (2013). *Porpoceras* probably derived from *Peronoceras* from that it differs in lack of regular fibulation.

Distribution: Bifrons to lower Variabilis/Gradatus Zones: Europe, the Caucasus, Iran, Pakistan, Russia, North and South America. Hungary: Bakony Mts (Csernye), Gerecse Mts.

Porpoceras vortex (SIMPSON, 1855)
(Plate 2, figs 2, 7, Plate 4, fig. 5)

- 1855 *Ammonites vortex* — SIMPSON, p. 60
 v 2007 *Porpoceras vortex* (SIMPSON) — GÉCZY & SZENTE, pl. 8, fig. 4
 2013 *Porpoceras* gr. *vortex* (SIMPSON) \square *verticosum* BUCKMAN — RULLEAU et al., p. 101, pl. 29, fig. 2, pl. 30, figs 1–2, pl. 31, figs 1, 3, 5, pl. 32, figs 1, 3–6, pl. 33, figs 1–2, pl. 34, fig. 1

Material: 26 specimens in different state of preservation (2014.45.1–26).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.45.1	93	19	20.4%	21	110.5%	58	62.3%
2014.45.2	91	18	19.7%	17	94.4%	58	63.7%
2014.45.3	90	18	20%	20	111%	53	58.8%
2014.45.4	83	17	20.4%	16	94%	?	?
2014.45.5	78	15	19.2%	17	113.3%	48	61.5%
2014.45.6	63	14	22.2%	16	114.2%	35	55.5%

Description: Evolute coiling, shallow umbilicus, slightly convex flats, low venter, depressed, subrectangular whorl-section. The body chamber is about 10/8 whorl in length, the peristome is oblique. Irregularly fibulate, tuberculate ribs on the inner whorls, while trifurcating, spined ribs alternate with simple ribs on the external whorls. Ventrolateral spines alternate on the two sides of the venter. Secondaries show a zigzag pattern on the venter.

Distribution: Gerecse sections: Semipolimum to Gemma horizons.

Porpoceras cf. *vorticellum* (SIMPSON, 1855)
(Plate 2, figs 3–4)

- 1855 *Ammonites vorticellus* — SIMPSON, p. 61
 1967a *Peronoceras* n. sp. aff. *vorticellum* (SIMPSON) — GÉCZY, p. 99, text-fig. 97, pl. 26, fig. 11
 1991 *Porpoceras vorticellum* (SIMPSON) — JIMÉNEZ & RIVAS, p. 176, pl. 7, figs 2–4 (*cum syn.*)

Material: Three poorly preserved specimens (2014.46.1–3).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.46.1	?58	15	25.8%	14	93.3%	36	62%
2014.46.2	35	7	20%	?	?	19	54.2%
2014.46.3	31	8	25.8%	9	112.5%	17	54.8%

Description: Evolute coiling, flat flanks, low venter, subquadrate whorl-section. Primary ribs

sharp, prorsiradiate, irregularly fibulate. Almost each primary rib bifurcates at ventrolateral shoulder, tuberculate and simple furcating points alternate.

Remarks: The species differs from *P. vortex* in denser and weaker ribbing, and in weakly developed tubercles.

Distribution: Gerecse Mts: Lusitanicum to Semipolitum horizon: Pisznice, Bánya Hill A, and Kis-Gerecse Sections.

Porpoceras beurleni (MONESTIER, 1931)
(Plate 2, fig. 5)

1931 *Caeloceras (Porpoceras) Beurleni* n. sp. —

MONESTIER, p. 48, pl. 1, figs 31, 35, pl. 9, fig. 11

1972 *Porpoceras beurleni* (MONESTIER) — GÜEX, p.

632, pl. 9, fig. 14, pl. 12, fig. 15

v 2007 *Peronoceras beurleni* (MONESTIER) — GÉCZY & SZENTE, pl. 1, fig. 3 (refigured here)

Material: One moderately preserved adult specimen (2014.47.1).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.47.1	57	12	21%	17	141.6%	33	57.8%

Description: Evolute coiling, convex flanks, flat venter, depressed, rounded subrectangular whorl-section. The preserved body chamber is a half whorl long. Primary ribs are strong, rectiradiate, distant, bifurcate, rarely trifurcate at ventrolateral tubercles. On the body chamber simple ribs appear irregularly crossing the venter and joining a tubercle on the opposite side. Fibulate ribs occur at the end of the last whorl. The sharp secondaries cross the venter in a zigzag pattern.

Remark: The specimen agrees with the neotype designated by GÜEX (1972).

Distribution: France. Gerecse Mts: Semipolitum horizon: Pisznice Section.

Genus *Catacoeloceras* BUCKMAN, 1923

Type-species: *Catacoeloceras confectum* BUCKMAN, 1923

Diagnosis: Moderately involute, depressed coiling, convex flanks, low, rounded venter, simple or bifurcating ribs, regular ventrolateral tubercles. Intricate suture-line: wide, developed E, somewhat shorter, trifid L, short U lobes, wide, ramified saddles.

Remarks: *Catacoeloceras* is the descendant of either *Peronoceras* or *Porpoceras*. It is characterized by sexual dimorphism, genus *Mucrodactylites* BUCKMAN is considered as microconch. *Catacoeloceras* —mainly *C. crassum*

(YOUNG et BIRD)— had been recorded many times from the lower Middle Toarcian of the Mediterranean Province (PINNA 1966). However, stratigraphical and paleobiogeographical revisions of the genus (PINNA & LEVI-SETTI 1971, HENGSBACH 1985, RIEGRAF 1986, RULLEAU et al. 2013) made it obvious that most figured specimens in the literature represent *Nodicoeloceras* taxa.

Distribution: Bifrons Subzone to middle Variabilis/Gradatus Zone: Europe, North Africa, Turkey, the Caucasus, Russia, Greenland, Indonesia, New Zealand, North and South America. Hungary: Bakony Mts (Csernye), Gerecse Mts. In the Gerecse sections it is known from the Gradatus Zone.

Catacoeloceras dumortieri (DE BRUN, 1932)
(Plate 2, fig. 6)

1932 *Coeloceras Dumortieri* n. sp. — DE BRUN, p. 106, pl. 5, fig. 3

v 2008 *Catacoeloceras dumortieri* (DE BRUN) — GÉCZY et al., p. 37, pl. 1, fig. 11 (*cum syn.*)

2013 *Catacoeloceras dumortieri* (DE BRUN) —

RULLEAU et al., p. 110, pl. 37, figs 2–3, 5–6, 8, pl. 38, figs 1–2

Material: One complete and one fragmentary specimens (2014.50.1–2).

Measurements	D	H	H/D	W	W/H	Uw	Uw/D
2014.50.1	48	10	20.8%	14	140%	23	48%

Description: Evolute coiling, slightly convex flanks, low, rounded venter, smooth on adult body chamber. The body chamber is somewhat shorter than one whorl in length, it becomes narrower on the last quarter whorl, the peristome is oblique, projected. Primary ribs straight, prorsiradiate, bifurcating at small ventrolateral tubercles, secondaries forwardly-curved.

Distribution: France, England, Germany, Italy, Austria, North Africa. Gerecse Mts: Gemma horizon: Kis-Teke Hill Section (2014.50.1), Subregale Subzone: Tölgyhát A Section (2014.50.2).

Catacoeloceras raquinianum (D'ORBIGNY, 1844)
(Plate 3, figs 1–2)

1844 *Ammonites Raquinianus* — D'ORBIGNY, p. 332, pl. 106, figs 1–5

2013 *Catacoeloceras raquinianum* (D'ORBIGNY) — RULLEAU et al., p. 111, text-fig. 42, pl. 38, figs 3–7, pl. 39, figs 6, 8–11, pl. 42, fig. 7

Material: One adult specimen (2014.51.1), and one wholly septate specimen from the private

collection of Zoltán EVANICS.

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.51.1	68	?15	22%	20	133.3%	?38	55.8%
EZPC.2013.2	43	12	28%	18	150%	21	48.8%

Description: Evolute coiling, convex flanks, broad, rounded venter, depressed, suboval whorl-section. The preserved body chamber is 3/4 whorl in length. Primary ribs strong, slightly prorsiradiate on the inner, rectiradiate on the last whorl, regularly bifurcating at small ventrolateral tubercles.

Remark: The species is typical of the NW European Province.

Distribution: France, Luxembourg, Germany, England, Spain, Bulgaria, ?Romania, Austria, ?Iran, ?Caucasus. Gerecse Mts: Tölgyhát Quarry and Bánya Hill Quarry Section without exact stratigraphic positions.

Genus *Mucrodactylites* BUCKMAN, 1927

Type-species: *Ammonites mucronatus* D'ORBIGNY, 1845

Diagnosis: Small shell, evolute, compressed coiling, rounded venter, suboval to subquadrate whorl-section, strong, simple and bifurcating primary ribs, projected secondaries. Suture-line: simple dactylioceratid with long, wide E, short, trifid L, short U lobes, high ES, wide, less ramified LS.

Remarks: Taxonomic treatments were presented by e.g. GUÉX (1973), ATROPS & MOUTERDE (1994), METODIEV (2003), and RULLEAU et al (2013). Species assigned to the genus are thought to be microconch forms of *Catacoeloceras*. *Mucrodactylites* was considered as a synonym of *Collina* by HOWARTH (2013).

Distribution: Bifrons Subzone to Lower Variabilis Zone: NW European localities, Italy, Austria, ?Greece, North Africa, North and South America, Russia, Spitsbergen. Hungary: Mecsek Mts, Gerecse Mts.

Mucrodactylites mucronatus (D'ORBIGNY, 1845)
(Plate 3, figs 3–4)

1845 *Ammonites mucronatus* — D'ORBIGNY, p. 328, pl. 104, figs 4–8

1994 *Mucrodactylites mucronatus* (D'ORBIGNY) — ATROPS & MOUTERDE, p. 92, pl. 33, figs 4–6

2013 *Mucrodactylites mucronatus* (D'ORBIGNY) — RULLEAU et al., p. 116, pl. 43, figs 1–8

Material: Two fragmentary specimens (2014.52.1–2), and one adult, complete specimen from the private collection of Mihály DUNAI.

M	D	H	H/D	W	W/H	Uw	Uw/D
DMPC.2013.3	39	9	23%	12.5	138.8%	22	56.4%
2014.52.1	38	10	26.3%	12	120%	20	52.6%
2014.52.2	35	9	25.7%	?9	100%	18.5	52.8%

Description: Evolute coiling, convex flanks, low, rounded venter, subrectangular whorl-section. The body chamber is 3/4 whorl in length, the peristome is preceded by a constriction. Primary ribs distant, sharp, rectiradiate, straight, bifurcating at small ventrolateral tubercles. Secondaries strong, forwardly projected, crossing the venter in pairs or in irregular zigzag pattern.

Remark: The species is regarded as microconch form of *C. raquinianum* in the literature.

Distribution: Gerecse Mts: Specimen 2014.52.2 came from the lower Subregale Subzone of the Kis-Teke Hill Section, the others were collected in the Bánya Hill Quarry Section, their exact stratigraphic positions are unknown.

Mucrodactylites sp.
(Plate 7, fig. 5)

Material: One fragmentary, adult specimen (2014.53.1).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.53.1	30	8	26.6%	9	112.5%	17	56.6%

Description: Evolute coiling, rounded flanks and venter. The whorl-section is depressed subrectangular on the inner whorls, subcircular on the body-chamber. Ribs strong, rectiradiate, moderately dense, tuberculate at the furcation points on the inner whorls. Simple and bifurcating primaries alternate, secondaries are slightly forwardly bent. The ribbing becomes prorsiradiate at the peristome.

Remark: The density of ribs of the specimen differs from that of most *Mucrodactylites* species, it resembles the example figured by PINNA & LEVI-SETTI (1971, pl. 11, fig. 6).

Distribution: Gerecse Mts: Apertum horizon of the Pisznice Section, Bed 123.

Genus *Septimaniceras* FAURE, 2002

Type-species: *Ammonites zitteli* OPPEL, 1862

Diagnosis: Small shell, evolute coiling, cadicone inner whorls, subquadrate external whorls, distant to dense, tuberculate ribs with weak ribs between them on the inner whorls,

alternating simple and looped ribs with ventrolateral tubercles on the last whorl. Suture-line: long, wide E, short, trifid L lobes, less ramified saddles.

Remarks: *Septimaniceras* was dealt with by FAURÉ (2002), HOWARTH (2013), and RULLEAU et al. (2013). It probably derived from *Peronoceras*. The genus is characterized by sexual dimorphism.

Distribution: Bifrons Subzone to Lower Variabilis Zone: France, ?Austria.

Septimaniceras cf. *nicklesi* (GUEX, 1971)
(Plate 3, fig. 5)

- 1971 *Collina nicklesi* n. sp. — GUEX, p. 238, pl. 2, fig. 3
2002 *Septimaniceras nicklesi* (GUEX) — FAURÉ, p. 712, pl. 9, fig. 24 (*cum syn.*)
2013 *Septimaniceras nicklesi* (GUEX) — RULLEAU et al., pl. 46, figs 6–11

Material: One adult macroconch specimen (2014.54.1).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.54.1	22.5	7	31%	8	114.2%	11	48.8%

Description: Evolute coiling, parallel flanks, low, slightly rounded venter, subquadrate whorl-section. The body-chamber is 3/4 whorl in length. Ribs slightly prorsiradiate, simple or fibulate and bifurcating at ventrolateral tubercles. The primaries become concave close to the peristome. Secondaries forwardly bent.

Remarks: The ornamentation with densely ribbed inner whorls is similar to that of *S. pseudoyoungi* (GUEX), but the almost flat ventral part, the whorl-section, and the sculpture of the last whorl are closer to that of the holotype of *S. nicklesi*, and to that of the examples represented in the literature. The state of preservation, however, does not allow the precise identification.

Distribution: Gerecse Mts: Bánya Hill Quarry Section, the exact stratigraphic position is unknown.

Subfamily Nodicoeloceratinae VENTURI et FERRI, 2001

The validity of the taxon is debated in the literature. Based on phylogenetic, morphological and paleobiogeographical considerations, it is accepted by authors who deal with the Mediterranean faunal province. The origin of the earliest representative (*Nodicoeloceras*) shows uncertainty. It derived from either (*D.*) *Orthodactylites* or *Kedonoceras* DAGIS in the uppermost Tenuicostatum Zone, and it was the ancestor of the characteristic Mediterranean

dactyloceratid genus *Mesodactylites*.

Genus *Nodicoeloceras* BUCKMAN, 1926

Type-species: *Ammonites crassoides* SIMPSON, 1855.

Diagnosis: Moderately evolute to cadicone coiling, depressed whorls, convex flanks, low venter, ribs bifurcating at ventrolateral shoulder, ventrolateral tubercles or spines usually present. Intricate suture-line: wide, developed E and L, short U lobes, ramified saddles.

Remarks: Taxonomic treatments were presented by e.g. PINNA & LEVI-SETTI (1971), SCHMIDT-EFFING (1972), HOWARTH (1978), JIMÉNEZ & RIVAS (1991), and RULLEAU et al. (2013). A few taxa have been interpreted as morphotypes of the characteristic NW European species *Nodicoeloceras crassoides* (SIMPSON).

Distribution: Serpentinum to Bifrons Zones: Europe, Russia, North Africa, the Caucasus, Iran, Pakistan, Indonesia, North and South America. Hungary: Bakony Mts (Csernye, Szentgál, Úrkút), Gerecse Mts. In the Gerecse sections, the genus appears in the Serpentinum Subzone, it is abundant in the Sublevisoni Subzone, and disappears from the fauna in the upper Bifrons Subzone.

Nodicoeloceras cf. *choffati* (RENZ, 1912)
(Plate 3, fig. 7)

- 1912a: *Coeloceras Choffati* n. sp. — RENZ, p. 86, pl. 6, fig. 5.
1971: *Nodicoeloceras choffati* (RENZ) — PINNA & LEVI-SETTI, p. 100, p. 128, text-figs 14/M, 18/A, 21/26, pl. 4, figs 3–7, 10, 13 (*cum syn.*)
2012 *Nodicoeloceras* cf. *choffati* (RENZ) — KOVÁCS, p. 20, pl. 5, figs 1–2 (*cum syn.*)

Material: One poorly preserved specimen (222.2011).

Measurement s	D	H	H/D	W	W/H	Uw	Uw/D
222.2011	46	12	26%	30	250%	19	41.3%

Description: Evolute coiling, deep umbilicus, oblique umbilical walls, slightly convex flanks, well-pronounced ventrolateral shoulder, low, broad and rounded venter, wide, rounded diamond-shaped whorl-section. No body chamber is preserved. Primary ribs rectiradiate, bi- or trifurcating at pronounced ventrolateral tubercles. Secondaries slightly forwardly bent, crossing the venter. Intricate suture-line.

Remarks: The specimen is similar to the type (RENZ 1912a, pl. 6, fig. 5) and to those figured in

the literature, but the poor state of preservation does not allow the certain identification.

Distribution: Portugal, France, Italy, Greece, Austria, North Africa, South America. Gerecse Mts: Striatus horizon: Bánya Hill B Section.

Nodicoeloceras crassoides (SIMPSON, 1855)
morphotype *multum* (BUCKMAN, 1928)
(Plate 3, fig. 8)

1926 *Multicoeloceras multum* — BUCKMAN, p. 42, pl. 785

v 1966 *Nodicoeloceras* n. sp. aff. *multum* (BUCKMAN)
— GÉCZY, p. 433, pl. 2, fig. 6

Material: Four fragmentary specimens (2014.29.1–4).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.29.1	53	14	26.4%	22	157%	23	43.4%

Description: Moderately evolute coiling, convex flank, rounded venter, wide, depressed, rounded subrectangular section. The length of the body chamber cannot be searched, the peristome is preceded by a wide constriction. Primary ribs sharp, straight, slightly prorsiradiate, simple or bifurcating at the shoulder. Several furcation points bear small tubercles, secondaries straight. The suture-line is richly ornate with long, ramified lobes and saddles.

Remark: *N. tuberculatum* differs in subrectangular section, and in ornamentation with stronger tubercles and fibulate ribs on adult body chamber.

Distribution: Bifrons Zone: England. Hungary: Bakony Mts (Úrkút). Gerecse Mts: Lusitanicum to Apertum horizons: Pisznice and Kis-Gerecse Sections.

Nodicoeloceras crassoides (SIMPSON, 1855)
morphotype *fonticulum* (SIMPSON, 1855)
(Plate 4, fig. 1)

1855 *Ammonites fonticulus* — SIMPSON, p. 57

1912 *Coeloceras fonticulum* (SIMPSON) — BUCKMAN, pl. 59

1967a *Peronoceras* cf. *fonticulum* (SIMPSON) — GÉCZY, p. 98, text-fig. 95, pl. 26, fig. 2

2012 *Catacoeloceras crassum* (YOUNG et BIRD) — KOVÁCS, p. 18, pl. 5, figs 3–4

Material: 3 wholly septate specimens (2014.28.1–3).

Measurements	D	H	H/D	W	W/H	Uw	Uw/D
215.2011	50	14	28%	24	170%	24	48%

Description: Moderately evolute coiling, convex flank, rounded venter, depressed subrectangular section. Primary ribs strong, rectiradiate, bifurcating at the shoulder. Tuberculate and non-tuberculate ribs alternate.

Remarks: *N. fonticulum* resembles *N. tuberculatum* in morphology, but differs in more depressed whorls and regular ornamentation.

Distribution: Serpentinum to Bifrons Zones: England, France, Luxembourg, Germany, Bulgaria, Italy, Greece, Spain, the Caucasus. Hungary: Bakony Mts (Csernye). Gerecse Mts: Lusitanicum horizon: Cocodile and Bánya Hill B Sections, Bifrons horizon: Kis-Teke Hill Section.

Nodicoeloceras tuberculatum (KOTTEK, 1966)
(Plate 4, figs 2–4, 6–7, Pl. 5, figs 6–7)

1966 *Catacoeloceras tuberculatum* n. sp. — KOTTEK, p. 135, text-fig. 65, pl. 17, figs 1–3

v 1966 *Peronoceras baconicum* n. sp. — GÉCZY, p. 438, pl. 1, fig. 2

2012 *Nodicoeloceras tuberculatum* (KOTTEK) — KOVÁCS, p. 18, pl. 6, figs 3–4 (*cum syn.*)

Material: 83 specimens in different state of preservation (Middle Toarcian: 2014.30.1–72, and one specimen from the private collection of Zoltán EVANICS).

M	D	H	H/D	W	W/H	Uw	Uw/D
221.2011	9 2	21	22.8 %	2 3	109.5 %	50	54.3 %
EZPC753 6	7 5	16	21.3 %	2 1	131.2 %	42	56%
2014.30.1	6 7	15	22.3 %	2 0	133.3 %	40	59.7 %
2014.30.2	5 1	13	25.5 %	1 8	138.4 %	27	53%
2014.30.3	5 0	12. 5	25%	1 8	144%	27	54%
2014.30.4	4 7	13	27.6 %	2 0	153.8 %	23	49%
2014.30.5	4 5	11	24.4 %	2 0	181.8 %	23	51%
2014.30.6	3 3	9	27.2 %	1 6	177.7 %	16. 5	50%

Description: Evolute coiling, convex flanks, broad and low venter, depressed, rounded subrectangular whorl-section. The body chamber is 5/4 whorl in length. Primary ribs strong, rectiradiate, bifurcating at ventrolateral tubercles on the phragmocone. On the body chamber one or two simple ribs alternate with bifurcating ribs, as well as fibulate bifurcating primaries occur irregularly that resemble the sculpture of *Peronoceras desplacei* (D'ORBIGNY).

Remarks: *N. tuberculatum* specimens show moderate variability in whorl-section and in style

of ribbing. The species is close to *N. crassoides* (SIMPSON) in morphology, but differs in depressed subrectangular section, and tuberculate–fibulate sculpture. *N. angelonii* (RAMACCIONI) is similar in size and morphology, but differs in subcircular section, and in lack of fibulate ribs. The genus level classification of the species is discussed in the literature. It is placed within *Nodicoeloceras* here because the phragmocone bear tuberculate but non-fibulate ribbing, therefore the ornamentation differs from that of genera *Mesodactylites* and *Peronoceras*. The taxon can be recognized as the Mediterranean counterpart of *N. crassoides*.

Distribution: Greece, Italy, North Africa, the Caucasus. Hungary: Bakony Mts, Gerecse Mts. In the Gerecse sections *N. tuberculatum* is the most frequent species of the genus, it ranges in the Falciferum Subzone (13 specimens) to the Bifrons Zone (lowermost Semipolium horizon) (70 specimens).

Nodicoeloceras crassoides (SIMPSON, 1855)
morphotype cf. *lobatum* (BUCKMAN, 1927)
(Plate 5, fig. 4)

1927 *Lobodactylites lobatum* — BUCKMAN, pl. 730

1967a *Catacoeloceras* cf. *lobatum* (BUCKMAN) —
GÉCZY, p. 95, text-fig. 92, pl. 26, fig. 5

1971 *Nodicoeloceras lobatum* (BUCKMAN) — PINNA &
LEVI-SETTI, p. 103, text-figs 14/S, U, 21/18, pl. 4,
fig. 8, pl. 5, figs 1–2, 7

2002 *Nodicoeloceras lobatum* (BUCKMAN) — FAURÉ, p.
709, pl. 9, fig. 5

Material: Four wholly septate specimens
(2014.27.1–4).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.27.1	38	10.5	27.6%	13	123.8%	18.5	48.6%

Description: Evolute coiling, convex flanks, almost flat venter, rounded subrectangular whorl-section. Rectiradiate, simple and bifurcating primary ribs alternate. Ventrolateral furcating points bear weakly developed tubercles, the secondaries cross the venter. The suture-line is richly ornate with ramified lobes and saddles.

Remarks: The species differs from both the nominate species and *N. tuberculatum* in narrower whorls, and in finer and denser ribbing without fibulation.

Distribution: England, France, Italy. Hungary: Bakony Mts (Csernye). Gerecse Mts: Sublevisoni horizon: Kis-Gerecse Section, Lusitanicum horizon: Tölgyhát Section, Semipolium horizon: Pisznice Section.

Nodicoeloceras angelonii (RAMACCIONI, 1939)

(Plate 5, figs 1, 3)

1939 *Deroceras Angelonii* (Mgh.) — RAMACCIONI, p.
182, pl. 12, fig. 13

1971 *Nodicoeloceras angelonii* (RAMACCIONI) — PINNA
& LEVI-SETTI, p. 104, text-figs 12/G, 14/T, 15/G,
18/B, 21/24, pl. 5, figs 9–10, pl. 6, figs 2–4

1991 *Nodicoeloceras* gr. *angelonii* (RAMACCIONI) —
JIMÉNEZ & RIVAS, p. 167, pl. 7, fig. 5

2013 *Nodicoeloceras angelonii* (RAMACCIONI) —
METODIEV et al., p. 71 (partim), fig. 3/j–k

Material: Five specimens in different state of
preservation (2014.31.1–5).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.31.1	65	15	23%	220	133%	36	55.3%
2014.31.2	50	12	24%	14	116.6%	27	54%

Description: Evolute coiling, convex flanks, rounded venter, subcircular whorl-section. Ribs sharp, rectiradiate, simple or bifurcating at small ventrolateral tubercles, dense on the phragmocone, somewhat distant on the body chamber. Fibulation absent.

Distribution: Italy, Greece, Southern Spain, Montenegro, Morocco. Hungary: Bakony Mts (Szentgál). Gerecse Mts: Sublevisoni Subzone: Pisznice, Bánya Hill A and Tölgyhát Sections.

Nodicoeloceras dulaii n. sp.
(Plate 5, fig. 5)

Holotype: 2014.32.1 (Eötvös Museum of
Natural History)

Derivation of name: In honour of Alfréd
DULAI, Hungarian paleontologist.

Type locality and horizon: Sublevisoni
Subzone, Bánya Hill A Section, Tardos, Gerecse
Mts.

Material: 1 well-preserved internal mold of an
adult specimen.

Measurements:

M	D	H	H/D	W	W/H	U w	Uw/ D	PRL W
2014.32. 1	4 4	1 1	25 %	13. 5	122 %	24	54%	65

Diagnosis: Evolute coiling, subquadrate whorl-section, sharp, rectiradiate, simple and bifurcating, tuberculate ribbing.

Description: Evolute coiling, moderately deep umbilicus, low umbilical wall, rounded margin, slightly convex, parallel flanks, rounded shoulder, flat venter, subquadrate whorl-section. The last whorl is slightly eccentric. The preserved part of the body chamber is 9/8 whorl in length. The ribs are sharp and rectiradiate. Simple and bifurcating

primaries alternate, furcating points bear well-developed ventrolateral tubercles. A few fibulate ribs appear irregularly on the phragmocone. The ribbing changes in style on the last half whorl, bifurcating fibulate pairs of primaries alternate with simple ribs. The secondaries are straight. Suture-line is dactyloceratid.

Remarks: Based on style of coiling, on irregular fibulation, on regularly tuberculate ribbing, and on lack of zigzag pattern of secondary ribs the new species is placed within genus *Nodicoeloceras*. Considering the size, and the appearance among abundant *N. tuberculatum*, the new species possibly represents a microconch form of the genus. *N. dulaii* n. sp. is similar to *N. tuberculatum* in ornamentation with fibulate ribs on the body chamber, however, it differs in size, and in subquadrate section. Two specimens figured by PINNA & LEVI-SETTI (1971) resemble the new species: *Peronoceras andrei* (SIMPSON) on plate 11, fig. 10, and *P. fibulatum* (SOWERBY) on fig. 16 bear similar fibulate sculpture, but both have more involute coiling with higher whorls.

Distribution: The specimen came from Bed 44 of the Bányá Hill A Section associated with *Hildoceras lusitanicum*, *Nodicoeloceras tuberculatum* (34 specimens), *N. angelonii*, *Mesodactylites annulatiformis* (BONARELLI), *Polyplectus pluricostatus* HAAS, *Phymatoceras elegans* (MERLA).

Genus *Mesodactylites* PINNA et LEVI-SETTI, 1971

Type-species: *Coeloceras annulatiforme* BONARELLI, 1899, designated by PINNA & LEVI-SETTI (1971).

Diagnosis: Small to medium-sized, cadicone to moderately evolute coiling, convex flanks, rounded venter, subcircular section, ribs simple or bifurcating, ventrolateral tubercles mainly on the phragmocone. Suture-line: wide, long E, shorter, trifold L, short U lobes, wide, divided saddles.

Remarks: Detailed treatments of *Mesodactylites* were presented by e.g. PINNA & LEVI-SETTI (1971), DEZI & RIDOLFI (1975), VENTURI & FERRI (2001), VENTURI et al. (2010), and RULLEAU et al. (2013). The genus was recently recognized as a synonym of *Nodicoeloceras* by HOWARTH (2013). *Mesodactylites* is typical of the Mediterranean Province, as the descendant of *Nodicoeloceras*.

Distribution: Serpentinum to Bifrons Zones: Italy, Greece, Southern Spain, Portugal, Austria, Southern France, North Africa. Hungary: Bakony Mts (Úrkút), Gerecse Mts: Lower—Middle Toarcian.

Mesodactylites annulatiformis (BONARELLI, 1899)

(Plate 5, fig. 2, Plate 6, fig. 1)

1867–1881 *Ammonites (Stephanoceras) Desplacei* D'ORBIGNY — MENEGHINI, p. 76, pl. 16, figs 7–8.

1899 *Coeloceras annulatiforme* — BONARELLI, p. 212

2012 *Mesodactylites* aff. *annulatiformis* (BONARELLI) — KOVÁCS, p. 20, pl. 4, figs 6–7 (*cum syn.*)

Material: Five poorly preserved specimen (217.2011, 2014.33.1–4).

M	D	H	H/D	W	W/H	Uw	Uw/D
217.2011	78	18	23%	18	100%	?	?
2014.33.1	60	14	23.3%	18	128.5%	31	51.6%

Description: Moderately evolute coiling, shallow umbilicus, convex flanks, low, rounded venter, and subcircular whorl-section. The body chamber 5/4 whorl long. Ribs moderately dense, sharp, rectiradiate, passing the venter. Some primaries bifurcate above the mid-height at small tubercles, others bifurcate without any tubercles. 1–2 simple ribs occur between bifurcating ribs.

Distribution: Italy, Portugal, Greece, North Africa, (?)Austria, (?)northern Spain. Gerecse Mts: Four specimens from the Serpentinum Subzone. The specimen figured here came from the Sublevisoni Subzone in the Bányá Hill A Section.

Mesodactylites mediterraneus (RENZ, 1912)
(Plate 6, fig. 2)

1912a: *Coeloceras Desplacei* D'ORB. n. var. *mediterranea* — RENZ, p. 68

1971: *Mesodactylites mediterraneus* (MEISTER) — PINNA & LEVI-SETTI, p. 93, p. 127, text-fig. 21/1, pl. 2, figs 9, 13, 14, pl. 3, fig. 9 (*cum syn.*)

2012: *Mesodactylites mediterraneus* (RENZ) — KOVÁCS, p. 20, pl. 6, figs 1–2 (*cum syn.*)

Material: One moderately preserved specimen (225.2011).

M	D	H	H/D	W	W/H	Uw	Uw/D
225.2011	76	21	27.6%	26	123%	40	52.6%

Description: Evolute coiling, shallow umbilicus, rounded umbilical margin and ventrolateral shoulder, convex flanks, broad and low venter, depressed wide oval whorl-section. The preserved body chamber is one whorl in length. Moderately developed, radial, simple and bifurcating ribs alternate almost regularly, and cross the venter.

Remarks: *M. annulatiformis* is similar in morphology, but differs in more pronounced ribbing. *Nodicoeloceras crassoides* differs in wider whorls.

Distribution: Portugal, Spain, Italy, Greece,

Algeria. Gerecse Mts: uppermost Pseudoserpentinum horizon: Bányá Hill B Section.

Mesodactylites broilii (MITZOPOULOS, 1930)
(Plate 6, figs 3–4)

- 1930 *Coeloceras (Dactyloceras) Broilii* (nov. spec.) — MITZOPOULOS, p. 89, pl. 8, fig. 5a–c
1985 *Catacoeloceras broilii* (MITZOPOULOS) — HENGSBACH, p. 390, text-fig. 23, pl. 9, figs 28–29

Material: 11 moderately preserved specimens (2014.34.1–11).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.34.1	33	10	30.3%	14	140%	15	45.4%
2014.34.2	31	10	32.2%	14	140%	13	42%
2014.34.3	30	9	30%	13	144.4%	13	43.3%
2014.34.4	27	8	29.6%	12	150%	11	40.7%

Description: Moderately evolute coiling, convex flanks, and broad, rounded venter. Whorl-section depressed suboval on the inner, while slightly higher, subcircular on the last half whorl. The body chamber is 5/4 whorl in length. Ribs dense, sharp, rectiradiate, alternating simple and bifurcating. Furcation point tuberculate on the inner whorls. Ribs more distant and prorsiradiate at the peristome.

Distribution: Italy, Austria, Spain, southern France, Romania. Gerecse sections: Lusitanicum to Gemma horizons.

Mesodactylites sapphicus (RENZ, 1912)
(Plate 6, fig. 5)

- 1912b *Coeloceras Sapphicum* RENZ (nov. spec.) — RENZ, p. 613, text-fig. 26
1966 *Dactyloceras annulatiforme sapphicum* (RENZ) — KOTTEK, p. 129
1971 *Mesodactylites sapphicus* (RENZ) — PINNA & LEVI-SETTI, p. 94, text-fig. 21/3, pl. 2, fig. 12, pl. 3, figs 1–3
v 2008 *Mesodactylites sapphicus* (RENZ) — GÉCZY et al., pl. 1, fig. 10

Material: Three specimens in different state of preservation (2014.35.1–3).

Measurement s	D	H	H/D	W	W/H	Uw	Uw/D
2014.35.1	40	10	25%	15	150%	21	52.5%

Description: Moderately evolute, depressed coiling, convex flanks, broad venter, and rounded subrectangular whorl-section. The body chamber is 5/4 whorl in length. Ribs concave, bifurcating at the shoulder. Primaries fine on the phragmocone, ventrolateral tubercles at all fourth furcation point. Ribs simple, distant and strong on the last half

whorl.

Distribution: Greece, Italy. Gerecse Mts: Lusitanicum horizon of the Bányá Hill A Section, and Gemma horizon of the Kis-Teke Hill Section.

Mesodactylites merlai (PINNA, 1969)
(Plate 6, figs 6–7)

- 1969 *Peronoceras merlai* n. sp. — PINNA, p. 16, pl. 4, fig. 9
1991 *Nodicoeloceras merlai* (PINNA) — JIMÉNEZ & RIVAS, p. 166, pl. 4, figs 9–14

Material: One wholly septate, and one fragmentary specimens (2014.36.1–2).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.36.1	63	16	25.3%	18	112.5%	34	54%
2014.36.2	45	10	22.2%	?	?	22	48.8%

Description: Moderately evolute coiling, convex flanks, rounded venter, depressed suboval to subcircular whorl-section. The preserved body chamber is more than one whorl in length. Primary ribs dense, rectiradiate to slightly prorsiradiate, simple or fibulate and tuberculate on the inner whorls, mostly simple on the second half of the last whorl.

Distribution: Italy, southern Spain. Gerecse Mts: Lusitanicum horizon: Pisznice Section.

Mesodactylites piznicensis n. sp.
(Plate 6, fig. 8)

Holotype: 2014.37.1 (Eötvös Museum of Natural History)

Derivation of name: The name refers to the type locality.

Type locality and horizon: *Hildoceras apertum* horizon, Pisznice Section of Nagy-Pisznice Hill, Süttő region, Gerecse Mts.

Material: 1 well-preserved internal mold.

Measurements:

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.37.1	54	12	22.2%	20	166%	31	57.4%

Diagnosis: Medium-sized, evolute, depressed coiling, suboval whorl-section, sharp, simple or spined, bifurcating ribs.

Description: Evolute shell, wide, deep umbilicus, rounded umbilical margin and ventrolateral shoulder, convex flanks, broad, rounded venter, depressed, suboval section. The preserved body chamber is one whorl long, peristome absent. Primary ribs are sharp, slightly prorsiradiate, irregularly bifurcating at well-developed ventrolateral spines. 2–4 simple ribs occur between each bifurcating rib. There is a single fibulate–bifurcating pair of ribs on the body

chamber. Suture-line is dactyloceratid.

Remarks: Based on suture-line and morphology, the new species is placed within genus *Mesodactylites*. It is closely allied to *M. merlai* in size and coiling, but differs in spined ribbing, and in lack of specific fibulate ribs on the inner whorls. Both *M. annulatiformis* and *Nodicoeloceras angelonii* differ in lack of spines, *N. tuberculatum* differs in higher whorls with tuberculate and fibulate ribbing, and *N. crassoides* (SIMPSON) differs in ornamentation and stratigraphic range. *N. spicatum* (BUCKMAN) bears similar spined ribbing on the inner whorls, but it is characterized by more involute coiling, higher whorls, and radial ribs.

Distribution: The specimen came from Bed 123 of the Pisznice Section associated with *Mucrodactylites* sp., *Hildoceras apertum* GABILLY, *Frechiella kammerkarensis* (STOLLEY), *Phymatoceras narbonense* (BUCKMAN), *Furloceras pulcher* (MERLA), and *F. speciosum* (MERLA).

Genus *Transicoeloceras* PINNA, 1966

Type-species: *Transicoeloceras angustum* PINNA, 1966.

Diagnosis: Small, involute to sphaerocone coiling, deep umbilicus, broad, convex venter, rounded subtrapezoid whorl-section with maximum thickness at the shoulder. Ribs fine, simple or furcating, tuberculate. Suture-line: wide, long E and L, short U lobes, wide, less intricate saddles.

Remarks: The genus was dealt with by PINNA (1966), PINNA & LEVI-SETTI (1971), JIMÉNEZ & RIVAS (1991), VENTURI & FERRI (2001), RULLEAU et al. (2013). It appeared in the Bifrons Subzone, and probably derived from *Mesodactylites*. The genus was recognized as *Catacoeloceras* by HOWARTH (2013), but the validity is sustainable for morphological, stratigraphical and geographical reasons.

Distribution: Bifrons to lower Gradatus Zones: Italy, Southern Spain, France, South America. Hungary: Bakony Mts (Úrkút), Gerecse Mts.

Transicoeloceras viallii PINNA, 1966 (Plate 7, figs 1–2, 7)

1966 *Transicoeloceras viallii* n. sp. — PINNA, p. 126, text-fig. 2/b, pl. 7, figs 16–17

1967b *Catacoeloceras tethysi* n. sp. — GÉCZY, p. 294, text-figs 1–7

1991 *Transicoeloceras viallii* (PINNA) — JIMÉNEZ & RIVAS, p. 176, pl. 7, figs 2–4 (*cum syn.*)

Material: Eight poorly preserved specimens

(2014.40.1–8).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.40.1	23	10	43.4%	18	180%	6	26%
2014.40.2	20	7	35%	14	200%	?	?
2014.40.3	18	?	?	15	?	?	?

Description: Cadicone coiling, narrow, deep umbilicus, low, oblique flanks, and broad, rounded venter. Primary ribs fine, rectiradiate, often fibulate to strong ventrolateral tubercles, irregularly bi-, tri- or quadfurcating. Secondaries fine and dense.

Remarks: *T. viallii* moderately varies in ornamentation. The specimen presented by GÉCZY (1967b) as *tethysi* n. sp. bears a non-tuberculate body chamber with bifurcating ribs.

Distribution: Gerecse sections: Lusitanicum to Bifrons horizons.

Genus *Telodactylites* PINNA et LEVI-SETTI, 1971

Type-species: *Peronoceras eucosmus* LIPPI-BONCAMBI, 1947, designated by VENTURI & FERRI (2001).

Diagnosis: Small to medium-sized shell, evolute, depressed coiling, wide and deep umbilicus. Oblique flanks, broad and low venter. Wide subtrapezoidal whorl-section with maximum thickness at the shoulder. Sharp, dense, tuberculate, fibulate and spined ribbing. Suture-line: wide, ramified E, shorter, trifid L, short U lobes, well-developed, divided ES, narrower, divided LS1.

Remark: The genus was regarded as a synonym of genus *Porpoceras* by HOWARTH (2013), however, the validity was acknowledged by VENTURI & FERRI (2001), VENTURI et al. (2010), and RULLEAU et al. (2013). *Telodactylites* is typical of the Mediterranean Province, and is considered as the Mediterranean counterpart of *Porpoceras*. The origin of the genus is uncertain, it is probably the descendant of *Mesodactylites* in the upper Bifrons Subzone.

Distribution: Gradatus Zone: Italy, Greece, Southern Spain, Austria, Portugal, North Africa, Chile. Hungary: Bakony Mts (Csernye), Gerecse Mts.

Telodactylites eucosmus (LIPPI-BONCAMBI, 1947) (Plate 7, figs 3–4)

1947 *Peronoceras eucosmus* MERLA in schedis — LIPPI-BONCAMBI, p. 145, pl. 2, fig. 21

v 1967a *Peronoceras zeissi* n. sp. — GÉCZY, p. 98, text-fig. 96, pl. 26, fig. 1, pl. 44, fig. 39

2011 *Telodactylites eucosmus* (LIPPI-BONCAMBI) — GALÁCZ et al., p. 325, pl. 2, figs 2–3

2013 *Telodactylites eucosmus* (LIPPI-BONCAMBI) — RULLEAU et al., p. 105, pl. 36, figs 1, 4–5, 7, 10

Material: Three moderately preserved specimens: 2014.41.1–2, and SzO.2012.41 from the private collection of Orsolya SZÉKELYHIDI).

Measurement	D	H	H/D	W	W/H	U _w	Uw/D
2014.41.1	67	15	22.3%	17	113.3%	40	59.7%
SPC.2012.41	62	13	21%	19	146%	39	63%
2014.41.2	50	11	22%	14	127.2%	29	58%

Description: Evolute, depressed coiling, oblique and slightly convex flanks, edged shoulder, broad and low venter, and subtrapezoidal whorl-section. Three–four sharp, prorsiradiate or rectiradiate ribs are looped to long ventrolateral spines, separating irregularly by simple ribs rising from the umbilicus and crossing the venter. Three forwardly projected secondaries issue from each spine.

Remark: Recently a specimen of this rare species was represented from Tardos by RULLEAU et al. (2013, pl. 36, fig. 10).

Distribution: Gerecse Mts: Semipolitum horizon: Pisznice Section (2014.41.1), Gradatus Zone: Bányá Hill Quarry Section (SzO.2012.41), Crocodile Section without exact stratigraphic position (2014.41.2).

Telodactylites cf. *renzi* PINNA et LEVI-SETTI, 1971 (Plate 7, figs 6, 9)

1971 *Telodactylites renzi* n. sp. — PINNA & LEVI-SETTI, p. 117, text-figs 14/B, 21/7, pl. 10, figs 1–5

1975 *Telodactylites* cf. *renzi* (PINNA et LEVI-SETTI) — DEZI & RIDOLFI, p. 41, text-figs 113–115

1981 *Peronoceras* cf. *renzi* (PINNA et LEVI-SETTI) — HILLEBRANDT & SCHMIDT-EFFING, p. 49, text-fig. 18/c–e, pl. 4, fig. 8

Material: 11 poorly preserved specimens (2014.42.1–11).

M	D	H	H/D	W	W/H	U _w	Uw/D
2014.42.1	41	12	29.2%	24	200%	19	46.3%
2014.42.2	29	13	44.8%	20	153.8%	14	48.2%

Description: Moderately evolute, depressed coiling, low, oblique flanks, broad, low, rounded venter, and subrectangular section. Primary ribs strong, rectiradiate, simple or bi- or trifurcating at ventrolateral nodes or spines.

Remarks: Due to the poor state of preservation, the specific fibulate ribs on the inner whorls cannot be traced, nevertheless, the overall

morphology of the specimens is close to that of the types. *T. renzi* differs from *N. fonticulum* in wider and more depressed whorls.

Distribution: Italy, Chile. Gerecse sections: Sublevisoni to Subregale Subzones.

Telodactylites levisettii n. sp.
(Plate 7, fig. 8)

Holotype: 2014.43.1 (Eötvös Museum of Natural History)

Derivation of name: In honour of Franco LEVI-SETTI, Italian paleontologist.

Type locality and horizon: Bányá Hill A Section, Tardos, Gerecse Mts, the exact stratigraphic position is unknown.

Material: 1 well-preserved internal mold of an adult specimen.

M	D	H	H/D	W	W/H	U _w	Uw/D
2014.43.1	51	13	25.5%	12	92.3%	28	55%

Diagnosis: Evolute, compressed coiling, subquadrate whorl-section, simple or fibulate, tuberculate, bi- or trifurcating ribbing.

Description: Medium-sized, evolute, compressed coiling, shallow umbilicus, slightly convex flanks, low, almost flat, slightly rounded venter, subquadrate section. The body chamber is one whorl in length, the peristome is preceded by a constriction. Simple, bifurcating and fibulate ribs alternate irregularly on the innermost whorls, while ribs are regularly fibulate from the last quarter of the phragmocone. Furcating points tuberculate on the inner whorls, spined on the body chamber. Fibulate ribs regularly trifurcate on the first half of the body chamber, while the forwardly bent secondaries show a zigzag pattern on the last half.

Remarks: Based on the morphology, the species is placed within genus *Telodactylites*. *T. eucosmus* differs in wider whorls, subtrapezoid whorl-section, and looped, spined primary ribs, *T. renzi* differs in much wider, depressed whorls, *T. achermanni* PINNA et LEVI-SETTI differs in wider whorls with distant fibulate ribs. The morphology of the specimen resembles that of *Peronoceras fibulatum* (J. DE C. SOWERBY), but differs in more convex flanks, almost flat venter, not regularly fibulate inner whorls, and denser fibulation on the last whorl.

Genus *Collina* BONARELLI, 1893

Type-species: *Collina gemma* BONARELLI, 1893.

Diagnosis: Medium-sized, evolute, compressed coiling; subquadrate to suboval whorl-section;

rounded venter. Primary ribs widely spaced, straight, rectiradiate, single or fibulate, bi- or trifurcating at ventrolateral tubercles, secondaries arched forward, raised in the middle of the venter. Intricate suture-line: long and wide E, shorter, ramified L, straight U lobes, wide ES and LS1.

Remarks: Taxonomic treatments were presented by e.g. PINNA & LEVI-SETTI (1971), SCHMIDT-EFFING (1972), JIMÉNEZ & RIVAS (1991), VENTURI & FERRI (2001), VENTURI et al. (2010), and RULLEAU et al. (2013). The genus is one of the late descendant of *Mesodactylites*, it is typical of the Mediterranean Province.

Distribution: upper Bifrons to Gemma/Clausus Subzones: Italy, Southern Spain, Portugal, Greece, Austria, Morocco, Algeria, North and South America. Hungary: Bakony Mts (Csernye, Úrkút), Gerecse Mts. In the Gerecse sections, the genus ranges in the upper Bifrons to Clausus Subzones, and *C. gemma* BONARELLI forms a biohorizon in the latter subzone.

Collina gemma BONARELLI, 1893
(Plate 7, figs 10–11)

- 1893 *Collina Gemma* n. f. — BONARELLI, p. 205, text-fig.
v 1966 *Collina noszkyi* n. sp. — GÉCZY, p. 441, pl. 2, fig. 5
v 1967a *Peronoceras umbra* (RAMACCIONI, 1939) — GÉCZY, p. 100, text-fig. 98, pl. 26, fig. 4, pl. 64, fig. 40
v 1967a *Collina meneghinii* BONARELLI — GÉCZY, p. 102, text-fig. 99, pl. 25, fig. 5, pl. 64, fig. 41
v 2011 *Collina gemma* BONARELLI — GALÁČZ et al., pl. 6, fig. 4

Material: 87 specimens in different state of preservation (2014.48.1–87).

M	D	H	H/D	W	W/H	Uw	Uw/D
2014.48.1	62	15	24.2%	10,5	70%	35	56.4%
2014.48.2	60	13	21.6%	10	77%	37	61.6%
2014.48.3	57	12	21%	9	75%	35	61.4%
2014.48.4	54	13	24%	10	77%	32	59.2%
2014.48.5	50	11	22%	10	91%	31	62%
2014.48.6	50	12	24%	9	75%	30	60%

Description: Evolute coiling, shallow umbilicus, slightly convex flanks, subquadrate to suboval whorl-section. Low and rounded venter on the inner whorls. Primary ribs rectiradiate, single or paired, furcating at well-developed ventrolateral tubercles, distant on the inner, while dense on the last whorl. The forwardly projected secondaries form a pseudo-keel on the body chamber.

Remarks: As types of *C. gemma* (refigured by GALLITELLI WENDT 1969, pl. 6, fig. 3) and of *C. meneghinii* BONARELLI, 1899 (*A. subarmatus* in MENEGHINI 1867–81, pl. 14, fig. 6, refigured by PINNA 1969, pl. 4, fig. 7) are remarkably similar, the validity of the latter taxon was rejected by PINNA & LEVI-SETTI 1971. Although both species were accepted by VENTURI et al. (2010), based on morphological considerations, the arrangement by PINNA & LEVI-SETTI (1971) is acknowledged here.

Distribution: Gerecse sections: Semipolitum to Gemma horizons.

Collina cf. *kampemorpha* KOTTEK, 1966
(Plate 7, fig. 12)

1966 *Collina kampemorpha* nov. sp. — KOTTEK, p. 138, text-fig. 66, pl. 17, fig. 6

1971 *Collina kampemorpha* KOTTEK — PINNA & LEVI-SETTI, p. 113, fig. 21/22, pl. 9, figs 12, 14

Material: One fragmentary specimen (2014.49.1).

Measurements	D	H	H/D	W	W/H	Uw
2014.49.1	80	20	25%	17	85%	?

Description: a with evolute coiling, convex flanks, rounded venter, subquadrate section on the inner, suboval section on the last whorl. Ribs strong, tuberculate on the inner, looped to spines on the last whorl.

Remark: The overall morphology of the specimen is close to that of the type, but the poor state of preservation does not allow the certain arrangement.

Distribution: Greece, Italy. Gerecse Mts: Gemma horizon: Pisznice Section.

Conclusion

The taxonomic survey of the Dactyloceratidae completes the general picture of the Toarcian ammonite faunal composition of the Gerecse Mts. The family is represented by 13 genera with 31 species. Some species, whose Hungarian occurrence has been known only from the Mecsek Mts (*M. mucronatus*) or from the Bakony Mts (*N.*

multum, *N. lobatum*), are described now from the Gerecse Mts as well. A few species are first recorded from Hungary (*C. raquinianum*, *S. cf. nicklesi*, *N. angelonii*, *M. merlai*), and the rich material made possible to introduce four new species. Based on the diversity of the examined material, the taxonomic validity of the subfamily

Nodicoeloceratinae, and genera *Mesodactylites*, *Transicoeloceras*, and *Telodactylites* typical of the Mediterranean Province is confirmed here.

The Ammonitina assemblages studied here contain 335 dactylioceratid specimens. The taxonomic composition of this fauna is somewhat different from that of other Mediterranean localities. It is characterized by the abundance of *Collina* and the above mentioned characteristic Mediterranean genera; the most frequent species are *C. gemma* (26.2%) and *N. tuberculatum* (25%). Besides these Mediterranean taxa,

however, the relatively frequent occurrence of the characteristic NW European genera *Zugodactylites* (13.1%) and *Porpoceras* (9%) with sporadic appearance of *Catacoeloceras* (4 spp.), *Mucrodactylites* (4 spp.) and *Septimaniceras* (1 sp.) are remarkable. The results show a mixed palaeobiogeographic feature. The dominance of Phylloceratina and Lytoceratina is a clear Mediterranean feature, but the co-existence of Mediterranean and NW European Ammonitina genera indicates a presumed Submediterranean transitional area between the two faunal provinces.

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Plate 1

The specimens have been coated with ammonium chloride before photography, and are shown in their natural size.

Fig. 1. *Dactyloceras (Orthodactylites) semicelatum* (SIMPSON, 1843) – 2014.55.2, Bány Hill B, Bed 12 (Serpentinum Subzone)

Fig. 2. *Dactyloceras (Dactyloceras) commune* (SOWERBY, 1815) – 2014.25.1, Bány Hill A, Bed 45 (Sublevisoni Subzone)

Fig. 3. *Microdactylites tardosensis* n. sp. – 2014.26.1, 1x (3a–b), 1.5x (3c–d), Bány Hill A, Bed 45 (Sublevisoni Subzone)

Fig. 4. *Zugodactylites braunianus* (D'ORBIGNY, 1845) – 2014.38.5, Bány Hill A, Bed 42 (Sublevisoni Subzone)

Fig. 5. *Zugodactylites braunianus* (D'ORBIGNY, 1845) – 2014.38.2, Bány Hill A, Bed 42 (Sublevisoni Subzone)

Fig. 6. *Zugodactylites rotundiventer* BUCKMAN, 1926 – 2014.39.2, Bány Hill A, Bed 41 (Sublevisoni Subzone)

Fig. 7. *Dactyloceras (Orthodactylites) semicelatum* (SIMPSON, 1843) – 220.2011, Kis-Gerecse, Bed 113 (Serpentinum Subzone)

Fig. 8. *Peronoceras subarmatum* (YOUNG et BIRD, 1822) – 2014.44.3, Bány Hill A, Bed 40 (Bifrons Subzone)

Fig. 9. *Zugodactylites braunianus* (D'ORBIGNY, 1845) – 2014.38.1, Pisznice, Bed 124 (Bifrons Subzone)

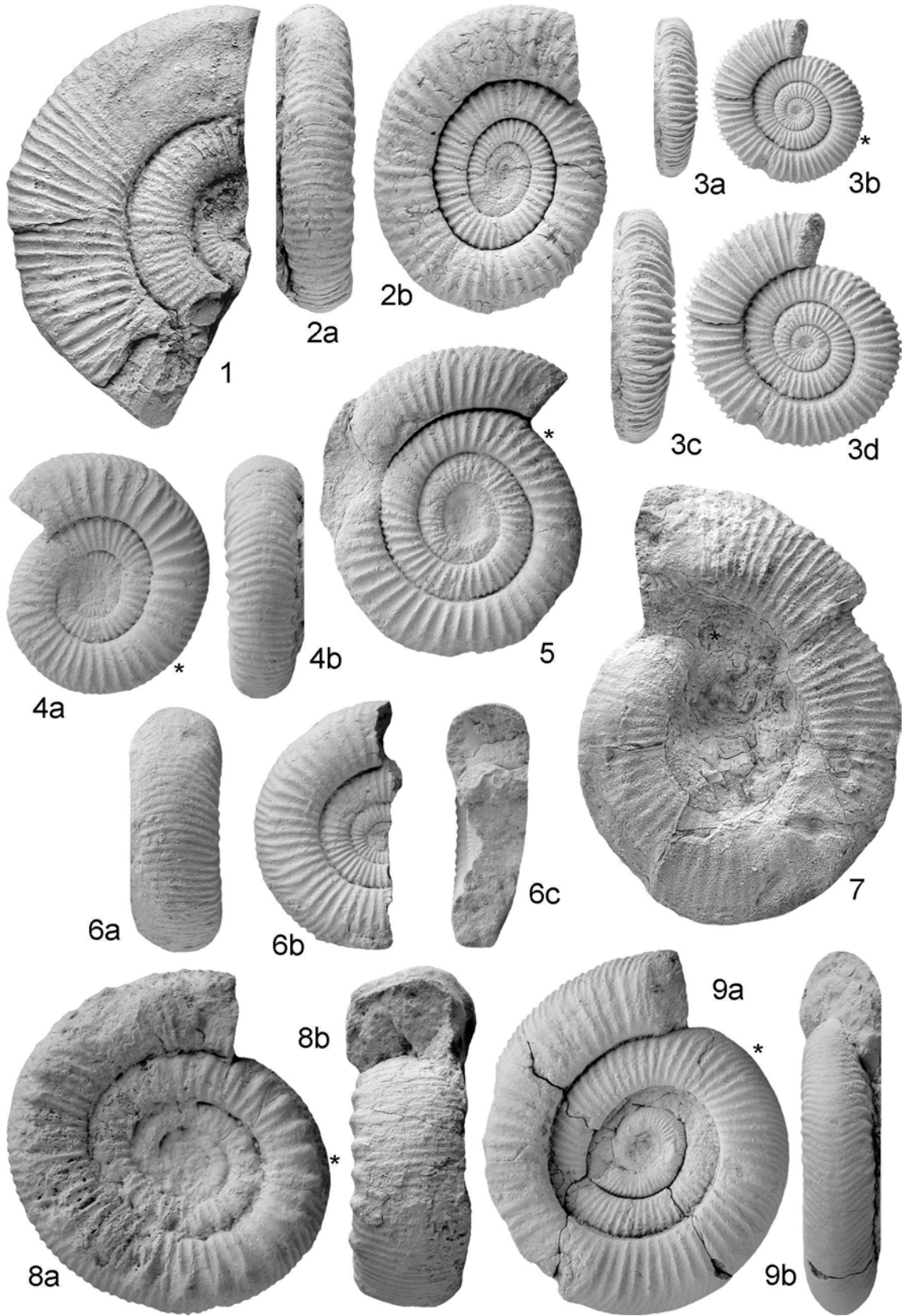


Plate 2

Fig. 1. *Peronoceras subarmatum* (YOUNG et BIRD, 1822) – 2014.44.2, Pisznice, Bed 120 (Bifrons Subzone)

Fig. 2. *Porpoceras vortex* (SIMPSON, 1855) – 2014.45.6, Kis-Gerecse, Bed 81 (Bifrons Subzone)

Fig. 3. *Porpoceras* cf. *vorticellum* (SIMPSON, 1855) – 2014.46.2, Bánya Hill A, Bed 41 (Sublevisoni Subzone)

Fig. 4. *Porpoceras* cf. *vorticellum* (SIMPSON, 1855) – 2014.46.1, Kis-Gerecse, Bed 83 (Bifrons Subzone)

Fig. 5. *Porpoceras beurleni* (MONESTIER, 1931) – 2014.47.1, Pisznice, Bed 118 (Bifrons Subzone)

Fig. 6. *Catacoeloceras dumortieri* (DE BRUN, 1932) – 2014.50.1, Kis Teke Hill, Bed K13 (Clausus Subzone), (6a – ventral view at D 44)

Fig. 7. *Porpoceras vortex* (SIMPSON, 1855) – 2014.45.1, Kis-Gerecse, Bed 81 (Bifrons Subzone)

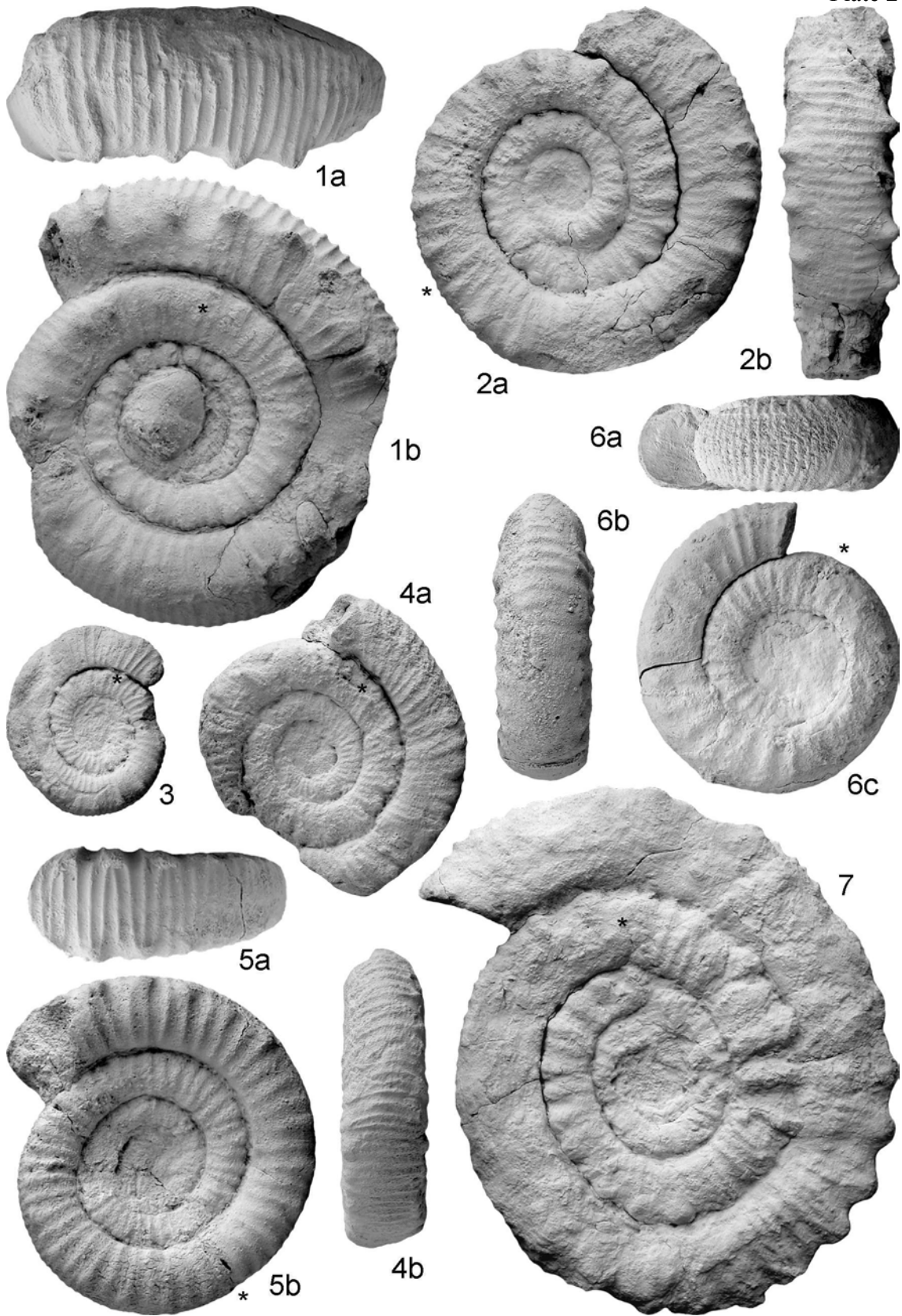


Plate 3

- Fig. 1. *Catacoeloceras raquinianum* (D'ORBIGNY, 1844) – 2014.51.1, Tölgyhát Quarry, from debris
- Fig. 2. *Catacoeloceras raquinianum* (D'ORBIGNY, 1844) – EZPC.2013.2, Bánya Hill Quarry, from debris, Collection Evanics, Z.
- Fig. 3. *Mucrodactylites mucronatus* (D'ORBIGNY, 1845) – DMPC.2013.3, Bánya Hill Quarry, from debris, Collection Dunai, M.
- Fig. 4. *Mucrodactylites mucronatus* (D'ORBIGNY, 1845) – 2014.52.1, Bánya Hill Quarry, from debris
- Fig. 5. *Septimaniceras* cf. *nicklesi* (GUEX, 1971) – 2014.54.1, Bánya Hill Quarry, from debris
- Fig. 6. *Peronoceras subarmatum* (YOUNG et BIRD, 1822) – 2014.44.1, Kis-Gerecse, Bed 81 (Bifrons Subzone)
- Fig. 7. *Nodicoeloceras* cf. *choffati* (RENZ, 1912) – 222.2011, Bánya Hill B, Bed 12 (Serpentinum Subzone)
- Fig. 8. *Nodicoeloceras crassoides* (SIMPSON, 1855) morphotype *multum* (BUCKMAN, 1928) – 2014.29.1, Kis-Gerecse, Bed 90 (Bifrons Subzone)

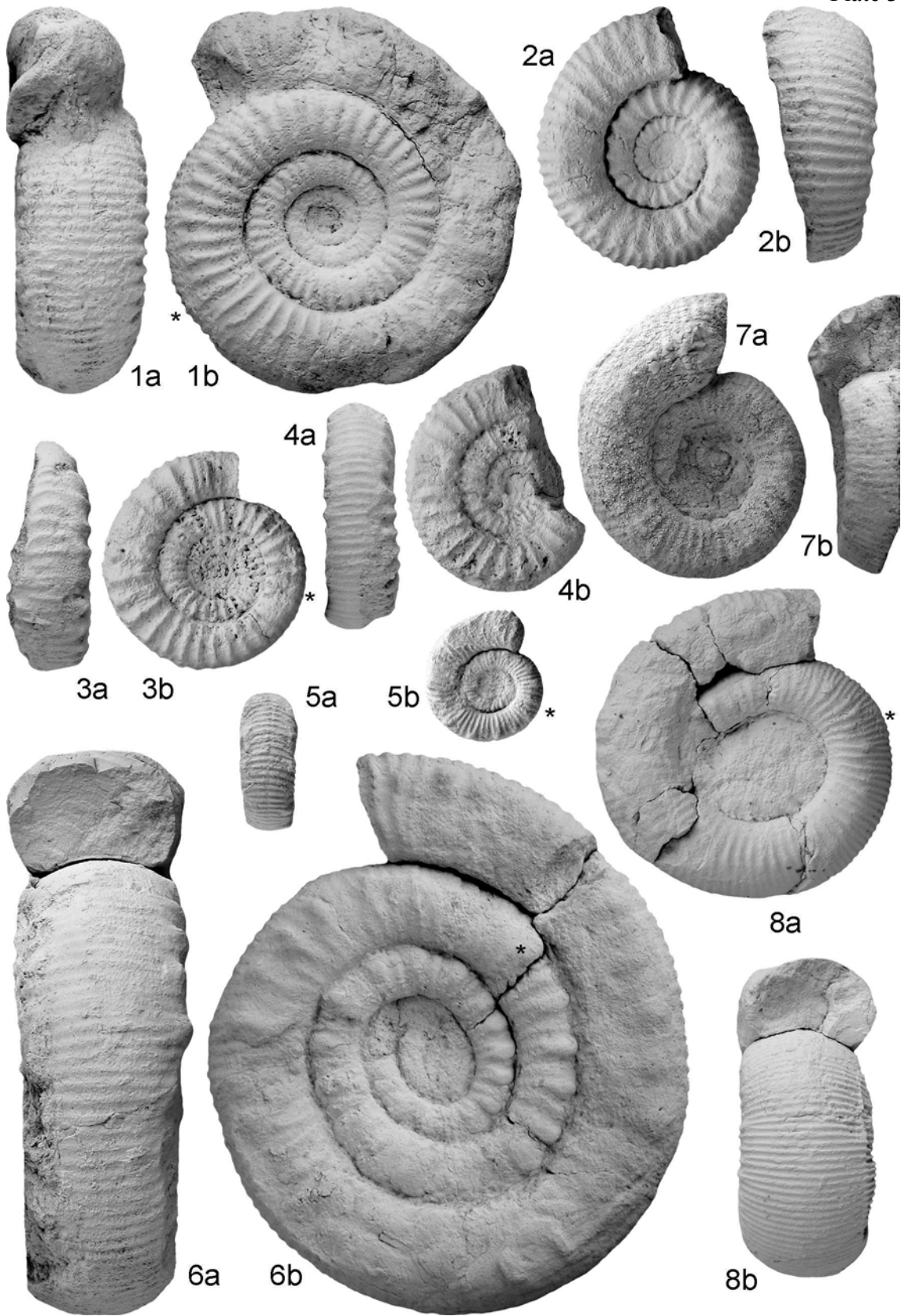


Plate 4

- Fig. 1. *Nodicoeloceras crassoides* (SIMPSON, 1855) morphotype *fonticulum* (SIMPSON, 1855) – 215.2011, Bánya Hill B, Bed 1 (Sublevisoni Subzone)
- Fig. 2. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – 2014.30.1, Bánya Hill A, Bed 44 (Sublevisoni Subzone)
- Fig. 3. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – EZPC7536, Bánya Hill Quarry, from debris, Collection Evanics, Z.
- Fig. 4. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – 2014.30.3, Bánya Hill A, Bed 43 (Sublevisoni Subzone)
- Fig. 5. *Porpoceras vortex* (SIMPSON, 1855) – 2014.45.2, Kis-Gerecse, Bed 79 (Clausus Subzone)
- Fig. 6. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – 2014.30.4, Bánya Hill A, Bed 44 (Sublevisoni Subzone)
- Fig. 7. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – 2014.30.6, Bánya Hill B, Bed 8 (Falciferum Subzone)

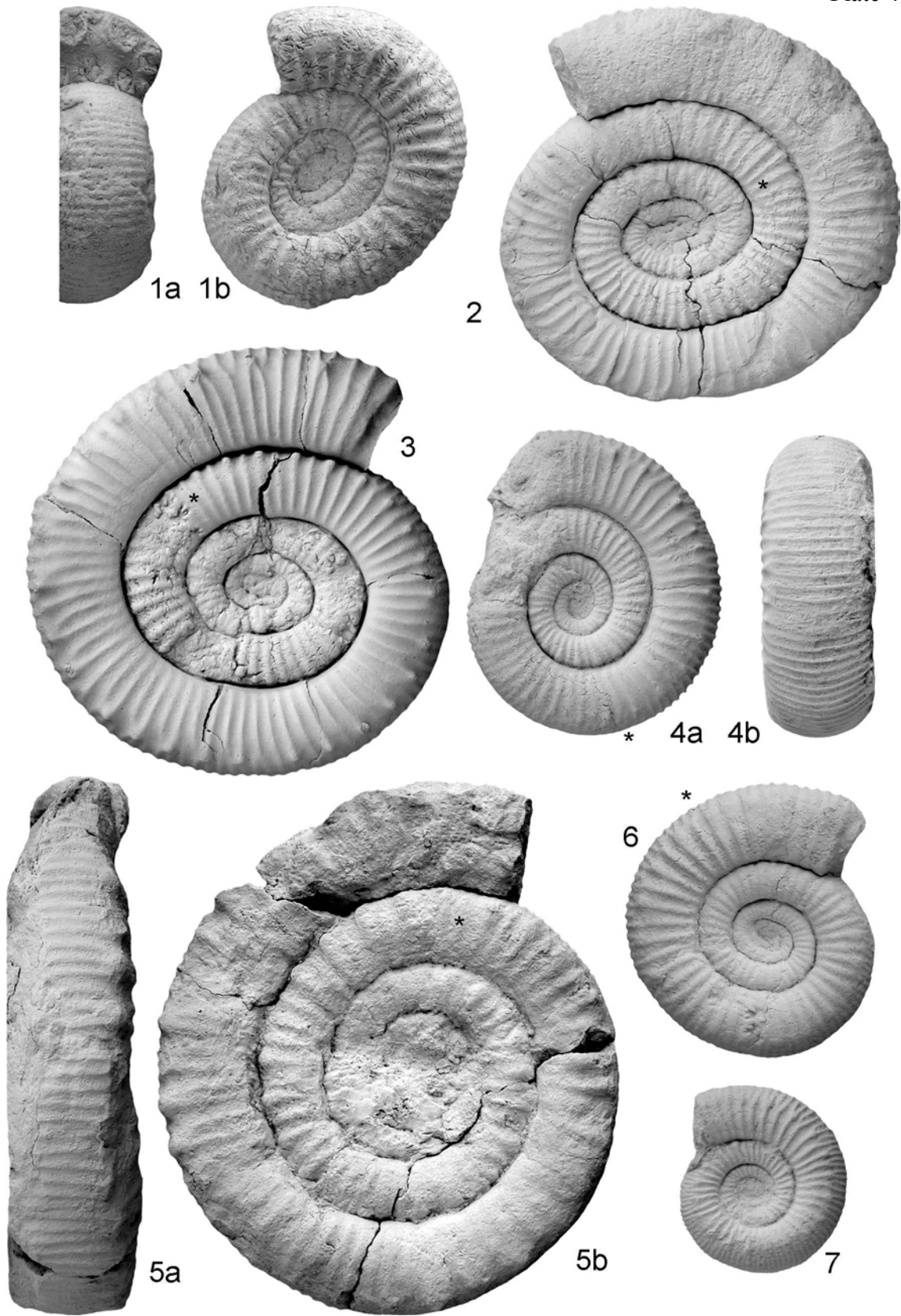


Plate 5

- Fig. 1. *Nodicoeloceras angelonii* (RAMACCIONI, 1939) – 2014.31.2, Tölgyhát A, Bed 113 (Sublevisoni Subzone)
- Fig. 2. *Mesodactylites annulatiformis* (BONARELLI, 1899) – 2014.33.1, Bánya Hill A, Bed 44 (Sublevisoni Subzone)
- Fig. 3. *Nodicoeloceras angelonii* (RAMACCIONI, 1939) – 2014.31.1, Tölgyhát A, Bed 113 (Sublevisoni Subzone)
- Fig. 4. *Nodicoeloceras crassoides* (SIMPSON, 1855) morphotype cf. *lobatum* (BUCKMAN, 1927) – 2014.27.1, Kis-Gerecse, Bed 97 (Sublevisoni Subzone)
- Fig. 5. *Nodicoeloceras dulaii* n. sp. – 2014.32.1, Bánya Hill A, Bed 44 (Sublevisoni Subzone)
- Fig. 6. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – 221.2011, Pisznice, Bed 133 (Falciferum Subzone)
- Fig. 7. *Nodicoeloceras tuberculatum* (KOTTEK, 1966) – 2014.30.2, Bánya Hill A, Bed 43 (Sublevisoni Subzone)

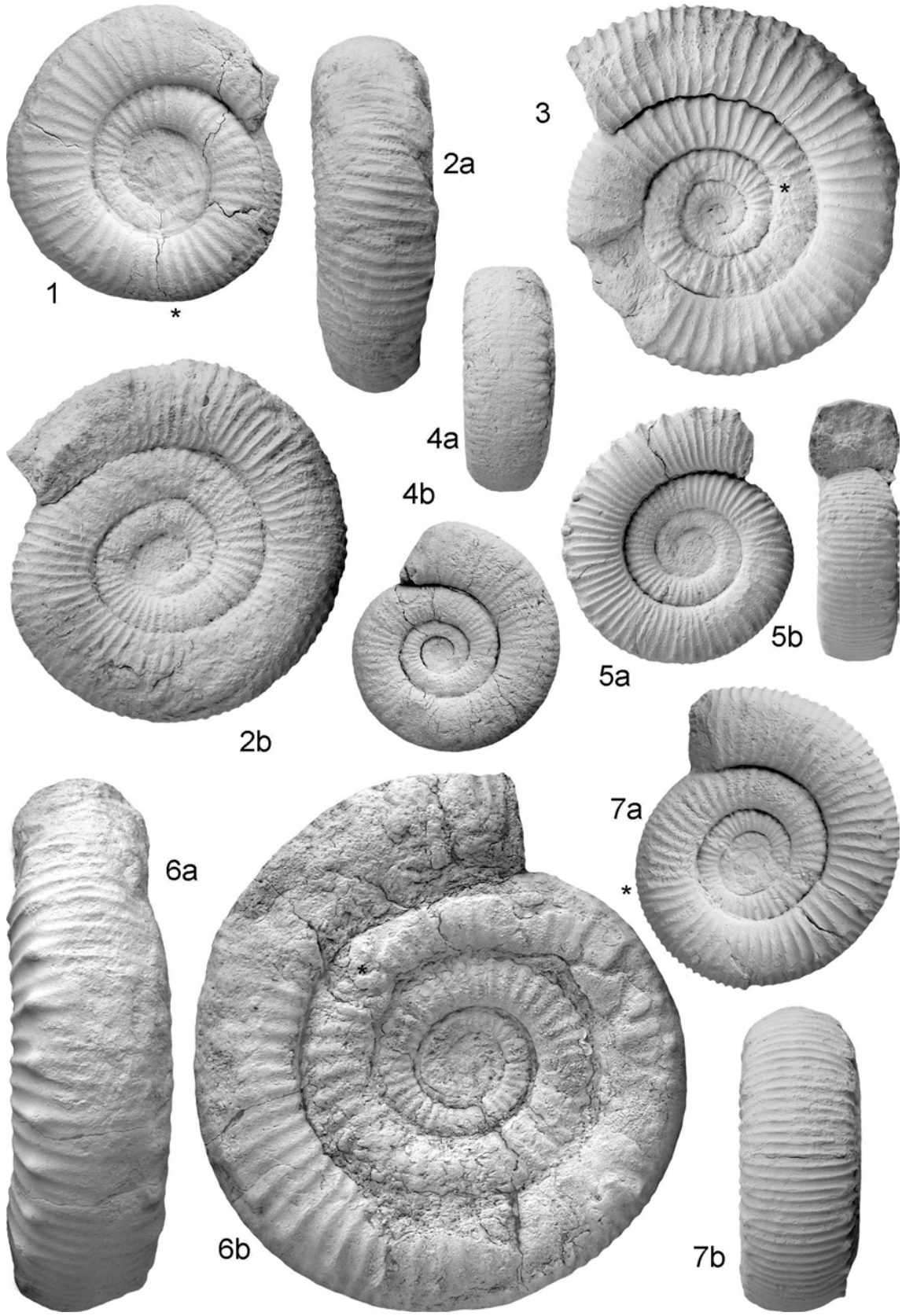


Plate 6

- Fig. 1. *Mesodactylites annulatiformis* (BONARELLI, 1899) – 217.2011, Kis-Gerecse, Bed 112 (Serpentinum Subzone)
- Fig. 2. *Mesodactylites mediterraneus* (RENZ, 1912) – 225.2011, Bánya Hill B, Bed 4 (Falciferum Subzone)
- Fig. 3. *Mesodactylites broilii* (MITZOPOULOS, 1930) – 2014.34.1, Bánya Hill A, Bed 36 (Bifrons Subzone)
- Fig. 4. *Mesodactylites broilii* (MITZOPOULOS, 1930) – 2014.34.4, Pisznice, Bed 128 (Sublevisoni Subzone)
- Fig. 5. *Mesodactylites sapphicus* (RENZ, 1912) – 2014.35.1, Bánya Hill A, Bed 41 (Sublevisoni Subzone)
- Fig. 6. *Mesodactylites merlai* (PINNA, 1969) – 2014.36.1, Pisznice, Bed 124 (Bifrons Subzone)
- Fig. 7. *Mesodactylites merlai* (PINNA, 1969) – 2014.36.2, Pisznice, Bed 124 (Bifrons Subzone)
- Fig. 8. *Mesodactylites pisznicensis* n. sp. – 2014.37.1, Pisznice, Bed 123 (Bifrons Subzone)

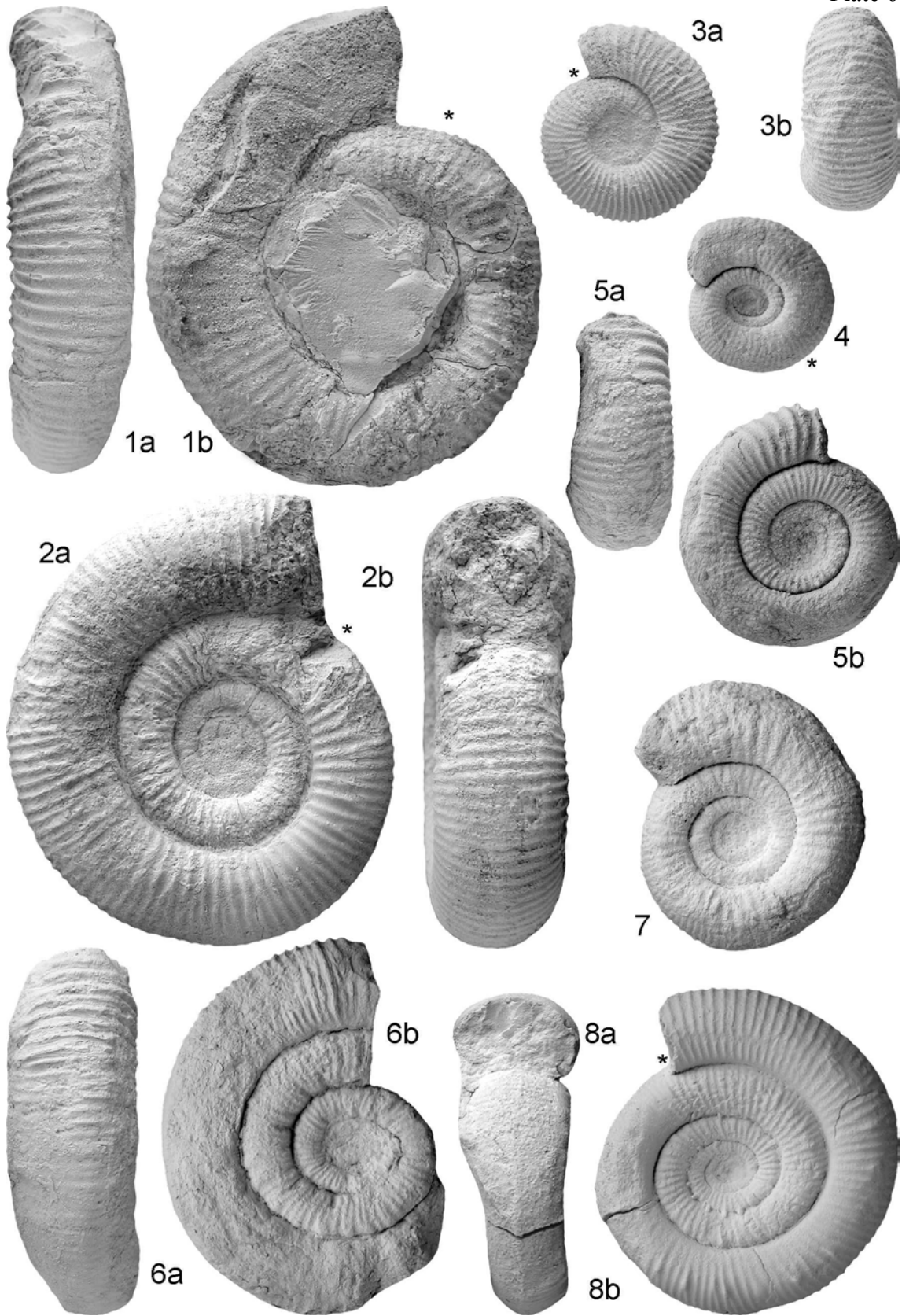


Plate 7

- Fig. 1. *Transicoeloceras viallii* PINNA, 1966 – 2014.40.2, Kis Teke Hill, Bifrons Zone, not bed by bed collection
- Fig. 2. *Transicoeloceras viallii* PINNA, 1966 – 2014.40.3, Kis-Gerecse, Bed 89 (Bifrons Subzone)
- Fig. 3. *Telodactylites eucosmus* (LIPPI-BONCAMBI, 1947) – 2014.41.2, Pisznice–Crocodile, from debris
- Fig. 4. *Telodactylites eucosmus* (LIPPI-BONCAMBI, 1947) – SPC.2012.41, Bánya Hill Quarry, Gradatus Zone, not bed by bed collection, Collection Székelyhidi, O.
- Fig. 5. *Mucrodactylites* sp. – 2014.53.1, Pisznice, Bed 123 (Bifrons Subzone)
- Fig. 6. *Telodactylites* cf. *renzi* PINNA et LEVI-SETTI, 1971 – 2014.42.1, Kis-Gerecse, Bed 92 (Sublevisoni Subzone)
- Fig. 7. *Transicoeloceras viallii* PINNA, 1966 – 2014.40.1, Kis Teke Hill, Bifrons Zone, not bed by bed collection
- Fig. 8. *Telodactylites levisettii* n. sp. – 2014.43.1, Bánya Hill A, from debris
- Fig. 9. *Telodactylites* cf. *renzi* PINNA et LEVI-SETTI, 1971 – 2014.42.2, Kis-Gerecse, Bed 87 (Bifrons Subzone)
- Fig. 10. *Collina gemma* BONARELLI, 1893 – 2014.48.4, Kis-Gerecse, Bed 79 (Clausus Subzone)
- Fig. 11. *Collina gemma* BONARELLI, 1893 – 2014.48.6, Kis Teke Hill, Bed K11 (Clausus Subzone)
- Fig. 12. *Collina* cf. *kampemorpha* KOTTEK, 1966 – 2014.49.1, Pisznice, Bed 117 (Clausus Subzone)

